

Çatalhöyük 2016 Archive Report

by members of the Çatalhöyük Research Project





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(Cover image by Jason Quinlan)
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Chapter I

Ups and Downs at Çatalhöyük 2016

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Since 1993 we have worked at the site for two to three months every summer, although in 1999 we excavated for six months in order to dig a deep sounding to the base of the East Mound. However, when we reached the lowest levels of occupation in 1999 we found ourselves not in houses but in areas of midden and animal pens. So we still did not know what the earliest houses at Çatalhöyük might look like. Given the new work being carried out by Douglas Baird at nearby Boncuklu, which shows the existence of oval houses in the millennia prior to Çatalhöyük, it seemed important to try to reach the base of the mound again in the hope of glimpsing the earliest phase of housing. And so for 2016 we planned a five month season with a core team of 12 excavators and 15 lab and support staff. We started on May 1 and all was going well until the civil unrest in Turkey in mid July that led to heightened concern amongst our research partners and amongst the team. I therefore decided to end the season after only three months, with the aim of completing the planned excavation in 2017.



Figure 1. First figurine found in Building 150 by the TPC team led by Arek Marciniak (photograph: Jason Quinlan).

Despite the shortened season we made some spectacular finds and learned much new about the site and its development through time. Perhaps of greatest interest to the media was the discovery of two remarkably preserved stone figurines. During July the core team had been joined by other researchers including the team from Poznan, Poland, led by Arek Marciniak. This team is now working in the TPC Area that links the South Area to the TP Area and the levels excavated by Mellaart at the top of the East Mound. These upper layers are distinctive in many ways, but one of the most intriguing is the prevalence of female figurines with the ‘three B’s’ prominent – bellies, buttocks and breasts. In 2016 two remarkable stone examples were found in Building 150 (see another headless example found in 2015 in this building and reported on in *Heritage Turkey* 2015). The first figurine was found next to the eastern wall of Building 150 and right by the northern edge of a burial. Its deposition is most likely associated with the construction of a platform. It seems to have been deliberately placed on the surface of an earlier platform and then covered by the new platform. The figurine (Fig. 1) is made of marble and was deposited with a portion of an obsidian blade. A

few days later a second figurine was found (Fig. 2) deposited just to the north of the larger one, made of limestone and placed inside a lump of marl. Near the head of this second figurine a piece of galena was found, shining and reflecting like a mirror, and also two blue beads. There are two perforations in the head as if the object was suspended on string.



Figure 2. Second figurine found in Building 150 (photograph: Jason Quinlan).

These depositions were undoubtedly very intentional and significant. The pairing of location, and the fact that both were deposited with obsidian or galena, are highly unusual. In these uppermost levels of the site (Building 150 is in a level equivalent to Mellaart's Level III), burial beneath platforms is less common than in the earlier levels and one intriguing suggestion is that these deposits replace inhumations. What is certain is that the depositions indicate the importance of closing and rebuilding platforms. Much of the media immediately latched onto these figurines as examples of the famous Çatalhöyük 'Mother Goddess'. However, research on such figurines and their clay counterparts at the site by Lynn Meskell, Carrie Nakamura and Lindsay Der has demonstrated that the focus on the 'three B's' at the site normally coincides with an emphasis on older, mature women, in which the three B's are often sagging. Rather than mother goddesses, these images seem to represent older women who have gained status and prestige in the community through their lifetimes.

Next to the 'up' trenches of TPC where these figurines were found, one descends 'down' to the deep excavations of the South Area. It is here that we are planning to get to the bottom of the East Mound in 2017. In preparation for that campaign, in 2016 we excavated Building 17 and its neighbour Building 160 with 161 below. I mentioned the large number of burials below Building 17 in *Heritage Turkey 2015*. In 2016 the burials just kept on coming until the whole floor began to look like a Swiss cheese (Fig.

3). As noted last year, many of these burials seem to be cut into midden, but it is the sheer number of burials that is most impressive. It is telling that Building 17 is the base of a sequence of elaborate buildings that Mellaart called 'Shrine 10'. In the buildings above Building 17 we excavated large numbers of burials in the 1990s, as did Mellaart in 'Shrine VI.10' in the 1960s. While we now accept that such buildings are domestic, it is clear that some buildings ('history houses') are important for burial and ritual over the long term. This was always a central house for burial.

Just to its east, however, is a stack of smaller buildings in which there are never many burials. Mellaart found a pair of leopards on the west wall of the main room of this building, and we have continued to excavate the building as Buildings 43, 160 and 161, going downwards in the stack. In



Figure 3. Overview of some of the burial pits in Building 17 (photograph: Jason Quinlan).

the earliest level so far excavated, Building 161 has some characteristics that suggest it was paired with Building 17. In particular, both have ovens in highly unusual locations – the northeast corner of the main room, and in both there is a curved wall separating off the northern part of the room. Also significant is that in both we found burials in which the torso had been covered with rodent scat, and in both there are burials with planks. This pairing of buildings in the early levels of occupation has been seen in the construction of Mellaart's Shrines 1 and 8 on the same raft, and in the very distinctive pairing of his Shrines 14 and 7 in Level VI. The pairing is presumably part of the larger focus on the interconnection between houses in the lower levels of occupation.

In the North Area of the site (Fig. 4) we concentrated on continuing the excavations in the large Building 132 that I described last year. We also started excavating an adjacent midden area. For the first time we excavated this as if it was a Palaeolithic cave, trying to tease apart the fine layers one by one, and plotting the position of all artifacts within a 1m grid. This proved an invaluable exercise as we were able to discern activity areas, hearths and work surfaces. This research is allowing us to understand for the first time how these open areas (a better term than 'midden') functioned.

Excavations also continued in the very burned Building 131 where many burials have been found with well preserved organic material including wooden bowls. Next to Building 131 is the earlier Building 5. This had been excavated in the 1990s but we had not excavated the floors, wanting to leave the building on display. In 2016 we decided to see if there were any burials beneath the floors, especially as the building above, Building 1, had contained over 62 burials. And indeed, below the northwest platform a remarkable rich set of secondary burials was discovered. Burial



Figure 4. View of the 2016 excavations in the North shelter with Building 132 in the foreground (photograph: Jason Quinlan).

F.3808 (Fig. 5) turned out to be the richest burial we have ever found at the site. In the upper part of the grave was a bundle of bones including a spinal column and a femur, all wrapped in a plant-based material. Below this bundle was a cinnabar-painted skull, placed inside a wood and basket container. Two flint daggers and a shell were also placed inside the container. Outside the container were 4 of the highest quality bifacially-flaked obsidian points that I have ever seen, pressed into some fibrous material, and a 'macehead' of white marble, beautifully and skillfully decorated in spiral meanders (Fig. 6).



Figure 5. Burial F.3808 showing skull in container with flint blades, as well as obsidian points, shell and macehead (photograph: Jason Quinlan).



Figure 6. Macehead from burial F.3808 (photograph: Jason Quinlan).

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Excavations

Chapter 2

Excavations in the North Area

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Introduction

This year, the current research project was to lead the final season of excavations in the North Area. The aims for the five month excavation season were to completely excavate Buildings 131 and 132, to answer specific research questions by conducting targeted excavations in Buildings 5 and 48, and to excavate external activity area Space 85 to understand the nature of external activity areas and the stratigraphic connections between a number of buildings (Fig. 1). Of particular importance was to reveal the archaeological formations under B.131 and B.132 so that they could be sampled for the North Area dating project led by Alex Bayliss. Because the excavation season was cut short, however,

these aims were not fully achieved. Nevertheless, excavations will continue in the following year (2017).

Building 5

Building 5 was uncovered in 1998. While the infill of the building was completely removed, its features were left untouched for public display. Despite continuous conservation efforts, because the building has been exposed to the elements for so long, extensive erosion has taken place on much of its surfaces and features.

This season, excavations in B.5 were targeted to answer a specific research question: Does B.5 contain any burials, and if so, what is their nature? This question relates to the nature of the development of specific house strands through time at Çatalhöyük. As the predecessor to B.1, which contained over 60 burials, was B.5 as remarkable in terms of being a central location for the interment of Çatalhöyük residents? Excavations therefore focused on the western platform (F.3809) located in its main space. Because the area of excavation

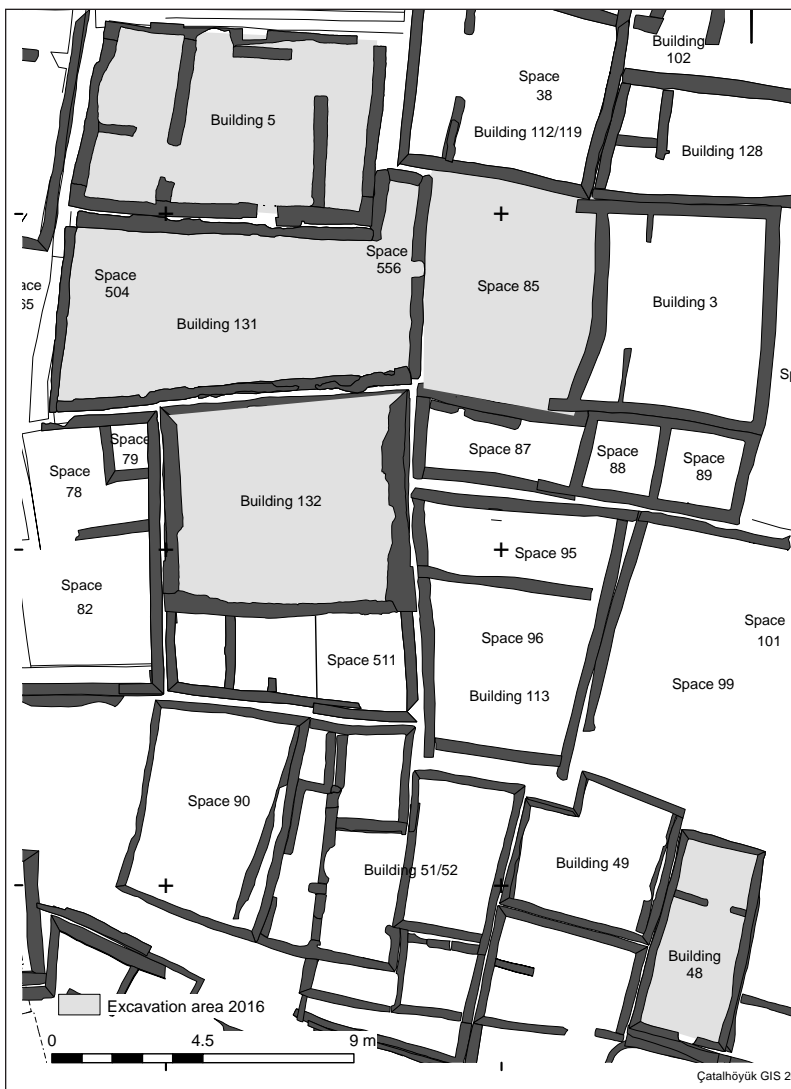


Figure 1. Overview of the 2016 excavations in the North Area (plan by Camilla Mazzucato).

was limited, the discussions below follow the archaeological sequence of excavation rather than stratigraphic deposition.

Previous records showed that the western platform was large platform containing a ledge where it met the western wall of Sp.154. The first line of work conducted here was to clean and record the nature of the deposits. In a short time, it became clear that in fact the ledge was a late addition to this area, which originally contained two platforms, a northwestern platform (F.3812) and a western platform (F.3811). Upon removing some eroded surfaces from the northwestern platform F.3812, recorded as (32202), (32203), and (32204), excavations here were halted after it became clear that a number of other features had to be removed in order to continue with the stratigraphic exploration of the platform floors, which had yet to reveal a burial cut.



Figure 2. Burial F.3808 in B.5; bundled post-cranial skeletal remains; facing south (photograph by Jason Quinlan).



Figure 3. Burial F.3808 in B.5: skull and artifacts found beneath bundled bones; facing south (photograph by Erica Camurri).

Initial cleaning and excavations on the western platform F.3811 revealed a different story. In fact, the outline of a cut could be seen from the beginning of the season centrally on the platform. However, a number of later deposits overlay the infill of the cut. First the latest feature on the platform, ledge F.243, was removed to expose the construction of a mini-buttress (F.248) that was previously recorded. The buttress, (22186) was likely constructed to support the eastward lean of the western wall. Underneath the buttress, two thick floors and their respective makeups were excavated as (22189), (22190), (22191) and (22192). (22192) sealed burial F.3808 (cut (33193), Sk (22196), Sk (22195), fill (22194)): "Burial F.3808 contains two superposed secondary depositions that might be related to the same event. The upper deposition is composed of a selection of partially disarticulated bones with its skull and feet missing, tightly wrapped into a bundle with matting or cord as seen by the phytoliths on the bones (Fig. 2). The lower deposition is composed of a red painted (and maybe plastered) skull placed into an organic container (most likely a basket)" EC, 7/22/16. The container that had the skull also contained two elaborate flint knives. Immediately west of the basket were two shells, four obsidian blades placed together with some reeds and a perforated ground stone ball, decorated with groups of opposing grooves (Fig. 3).

The way the burial was executed is intriguing. It had a deep (0.5m) rectangular (0.65x0.7m) cut with rounded edges. Once the basket and other items were placed, the north-

ern half of the cut was packed very tightly. Then the skeleton bundle was placed above the skull, and then sealed with rest of the fill. Burial F.3808 is undoubtedly one of the most symbolically complex burials found at Çatalhöyük.

Burial F.3808 cut two other burials, F.3811 and F.3813, both of which were excavated as well. Burial F.3810, also had a deep cut (0.66m). It contained the remains of a primary juvenile and the disarticulated bones of another juvenile across the fill. The bones of the juvenile were very fragile. Burial F.3813 was badly disturbed by F.3808. It contained the remains of at least two individuals.

The excavations conducted here this season demonstrated that B.5 is a unique building in its own right. Excavations in the building will not continue in the following season.

Building 48

Building 48 was excavated in 2004 and left for display. About 2.4 by 4.9m in size, it is one of the smallest buildings recorded at Çatalhöyük. The aim of the excavations here was to understand whether this building's size made it less suitable for burials within the building as no clear burial cuts were recorded in previous years. A thorough cleaning within the building was conducted. Much of the later floors of the building had eroded through time as the building was exposed to the elements. A small cut became apparent after initial excavations within the main space of the building, Sp.239 by the western platform. This cut contained the primary burial of a flexed juvenile aligned south-west north-east with its head to the south, facing north. There were no grave goods associated with the burial. The excavation of this burial made it clear that the size of a building did not determine whether it was a suitable place for burial or not. Excavations ended in the building once the burial was removed.

Building 131

Building 131 is a rectangular building oriented east-west and about 10.9m long and 5m wide, located in the North Area between B.77 and B.5. It is comprised of a main room (Sp.500), an eastern side room (Sp.504), with an additional space (Sp.556) extending to the north at the northeast corner of the building like a panhandle (Fig. 4). B.131 constitutes an important building in the sequence of architecture in the North shelter, as it stratigraphically ties in the B.1 and B.5 with the B.77 and B.132 strands to each other, and in doing so gives important insight to Neolithic practices. For this reason, B.131 was targeted for the dating project led by Alex Bayliss. As such, one of the main aims this excavation season was to excavate the building in its entirety to reach archeological deposits that could pre-date the construction of the building. Due to the brevity of the excavation season, the initial goal of excavating the building in its entirety was not accomplished. Nevertheless most activity deposits and architectural features within Sp.500 were recorded and excavated. In this process, it became clear that the western and southern activity areas transformed through time and changed in use through the different phases of the building. Because the phasing of the building has not yet been completed, these activity areas will be discussed individually in the following sections.

The northwestern platform and associated features and deposits

Northwestern platform F.7950 was largely unexcavated last year, except for burial F.7956 which was the latest activity that had taken place within the large platform. In this latest phase of use, the platform extended 2m by 1.4m, and was at least 0.3m above the central floor area (Fig. 5). This season's excavations revealed that this northwestern quadrant of Sp.500 went through extensive re-modeling and re-plastering episodes. These included: the construction and modification of kerb F.7995



Figure 4. Overview of B.131 towards the end of the season (orthophoto by Jason Quinlan).

which formed the eastern boundary of the northwestern quadrant and which was eventually incorporated into the last phase of platform use; the maintenance and modification of niche F.7986 which was cut into the northern wall of B.131; and the modeling of niche F.7999 which was located on western wall F.7708 of Sp.500.

Unfortunately, excavations this season did not reach the constructional phase of the building in this area. However, they did demonstrate that that a bench to the east (F.7994) and a curtain wall-like division (F.7995) to the south divided this area from the southern and the northern central floors of Sp.500. Bench F.7994 extended 1.3m to the south from engaged post F.7971 and was 0.26m wide. It seems to have been built from small mudbricks (32397), each about 0.3m long and 0.1m wide, placed in a double row, which currently remain *in situ*. It stood about about 0.3m. The brick structure was sealed by a thick plaster and makeup layer, (32377). Bench F.7994 may have actually



Figure 5. Overview of the northwestern platform and its associated features. Facing north (photograph by Jason Quinlan).

been built after, or expanded above the earliest incarnation of the southern division F.7995. Further excavation is necessary to reveal this relationship.

Division F.7995 was built in at least two phases. The earliest construction currently identified is a brick structure, (32544), that seems to sit above the earliest level of floors exposed in this area that remain *in situ*. These floors are on the same formation level with the floors that are to the south of the division. The upper section of division F.7995, excavated partially as (32542) abuts bricks (32397) that make up bench F.7994. Floors (32371) that covered the entire platform area lipped up upon both divisions.

It is not entirely clear whether niche F.7986 (Fig. 6), was cut into the northern wall immediately after its construction or sometime after the establishment of the building. It is however clear that the original extent of the niche would have been about 1.4m long, 0.30m deep and 0.3m tall. Wall plaster (32392) would have covered both the inside of the niche and the wall, and currently remains *in situ* only within the niche floor as wall F.7707 had to be excavated out of sequence at this section due to its collapse. The niche was plastered regularly and soon after its use, the eastern end was blocked off with rubble (32384), possibly because of the instability it caused on the northern wall due to its immense extent. In fact, two large ground stone pieces were propped upright, seemingly situated to also support the ceiling of the niche. The ground stones were sealed by (32385), a unit that represents about 20 plaster layers with corresponding preparation layers. Contemporaneous with the aforementioned unit was (32387), which represents at least 10 plastering events that took

place within the now smaller niche extending just shy of 1m. These plastering events significantly narrowed the height of the niche.

At this point, it is likely that post F.7991 was cut into the northwestern corner of the platform. No extensive charred timber remains were found within its fill (32341), but there was enough charcoal to suggest that a post may have once stood at the corner. The fill was heavily disturbed by rodent burrowing, although more compacted clay rich material was found around the edges of its cut (32341), suggesting packing behind a post. The post probably abutted wall plaster (32385) and was consequently abutted by multiple wall plastering events excavated as (32314) and (32305).



Figure 6. The later phase of niche F.7986. Notice the ground stone propped up against the niche. Facing north (photograph by Katie Campbell).

Once the post was put in place, the platform area was modified with the addition of a thick leveling layer. Following this were at least two floor-plastering episodes with their correlating make-ups. All of these deposits were excavated as (32365). These events also correlate with the re-plastering of the southern division with (32506) and (32370) and the maintenance of bench F.7994 with (32347). At this point it is possible that a small niche (F.7999) was carved into the western wall of Sp.500, immediately north of division F.7995. The niche seems to cut a number of wall plaster layers (32374) that correspond to an earlier phase of the building.

The platform was then replastered a number of times. About four or five of these episodes were excavated as (32344) and a later five to six layers were excavated as (32339). All of the floors were

made from marl with quite a bit of grass and even leaves embedded into their matrix. The marl floors had corresponding makeups that were sandier than the marl plaster. The floors were heavily burnt from the building's fire and were rather fragile. They were also not always continuous due to the trampling and use that occurred in the Neolithic. The upper floors contained more botanical matter, possibly due to the way in which the conflagration of the house charred the upper layers.

Burial F.7982 cut the latest floor sequence discussed above (Fig. 7). It was located immediately north east of burial F.7956, which was excavated last season. The cut for the burial was oval in an east-west orientation, about 0.65m long, 0.5m wide and 0.5m deep. It contained a primary adult, most likely a female buried tightly flexed, aligned with the cut, head to the east facing north. The individual was buried with a wooden bowl, 30092.x1. As the excavator notes: *"several beads were found with the body, including a bracelet around the mid right lower arm (30089.x7), and several next to (but not around) the right wrist (30089.x9). A number of beads were also found in the neck area (30089.x2-6, 30089.x10, 30089.x11), near the wooden bowl, probably forming a necklace"* KFC 6/15/16. The finds and the position of the body are very similar to burial F.7956, which came only a little later in the sequence within the same platform.



Figure 7. Detail of burial F.7982. Facing south (photograph by Jason Quinlan).

Last year, a pit was excavated immediately above burial F.7982 as retrieval pit F.7965. Upon further investigation, it became clear that this pit was post depositional disturbance. However, a post cut was located this season at the southeast corner of the platform and has been recorded as F.7993. This small post seems to have been a later addition to this northwest quadrant and may have

supported internal division F.7990 (see below). Another interesting feature that was excavated this year was F.7992, partially excavated out of sequence due to its condition. This feature represents three narrow and short posts, (32350), that have been mortared into the southeastern corner of bench F.7994 (Fig. 8). The placement of the posts are in alignment with division F.7990, so they were initially thought to be part of the general division of the building. However, according to feedback from the anthracology specialist, the three posts were not structural and although charred, did not lose much of their body. They were also a different species of wood than the ones used as structural timbers throughout the house. That there are three pieces together is certainly significant and most likely symbolic given that they were not necessarily structural. Further excavation is required to better understand both the nature and the sequence of this feature.



Figure 8. Bench F.7994 and posts within F.7992. Facing west (photograph by Katie Campbell).

The southwestern ‘quadrant’

The southwestern quadrant of Sp.500 is an area that is about 1.8m wide 2.8m long. It is defined to the north by platform F.7950, to the east by internal partition F.7990, to the south by F.7705, the building’s southern wall and to the west by partition wall F.7708. It is a heavily used and modified area that contained a number of fire installations, pits, and various storage features (Fig. 9). The conflagration at this section of the building was extremely volatile, and much of the Neolithic deposits were heavily destroyed. Further, extensive animal burrowing into the deposits have made it difficult to differentiate the boundaries of some of the features. Below is a summary of the deposits excavated at this area.

The earliest deposit reached here is the constructional phase of the area identified by a makeup (32541) that contains large clay aggregates and building materials that appear to look like rubble due to the conflagration of the building. This deposit remains *in situ*. This makeup has evidence



Figure 9. Overview of the entire western end of Sp.500. Facing east (photograph by Jason Quinlan).

of fire activities taking place above it, possibly relating to the construction of the internal features of the building. A cache, (32536), which contained two unworked pre-form blades, was buried within this makeup. A fire installation, F.4106, abutted the walls that formed the southeast corner of Sp.500. While its full extent is unclear, its burnt base (32529) covered an area that was 0.72m long and 0.62m wide. It was placed upon a makeup (32530) that surrounded it to the west and south. The superstructure of the fire installation was likely constructed from the same material but was truncated during a remodeling episode. The eastern edge of the base was eroded, which could be an indication of where the mouth of the oven was, if this fire installation was indeed an oven. Floors (32533), about two to three layers of floor and makeup laid immediately above the constructional makeup of the area most likely are contemporary with the use of the oven. Unit (32533) was sealed by (32514), four to five layers of plaster floors, some with an associated makeup layer, that again covered the entire southwest quadrant and is possibly contemporary with the oven.

Floors (32533) were cut by two features: a post-retrieval pit F.4104 located in the southeast corner of the area and a shallow basin-like feature, F.4108, about 0.5m in diameter and 0.5m deep, towards the southern end of the area. The fill of the post-retrieval pit, (32522) inconspicuous as it did not reveal clay rich packing abutting the original cut for the post that had retained its structure *in situ*. This cut was recorded as part of the post-retrieval cut (32523) due to time constraints. The features discussed in the paragraph above, as well as oven F.4101 were sealed by floors (32348), a few series of heavily damaged and truncated floor surfaces that ran across the entirety of the southwestern quadrant.

Floors (32348) mark a new phase in the remodeling of this part of Sp.500. An oven, F.4103, was centrally cut into the southern wall. The oven “consists of one remaining base, (32507), with a remnant of an earlier base in leveling (32517).” With evidence of only two major repairs of its floors, oven F.4103 may have been relatively short-lived, despite its substantial size, extending 0.7m wide and most likely 0.6m deep and 0.5m tall. The dome-shaped oven was truncated during the demolition of the

building and by the construction of B.77. After the use of its latest floors, the oven was turned into a niche and plastered with a fine layer of plaster (32502). The niche was later blocked and completely plastered over at latest occupation phase of the southwestern quadrant of Sp.500. At this time, there is no evidence of the use of fire installations in this area.

The remnants of a hearth, that also cut through floors (32348) was found centrally in the southwestern quadrant. The hearth was likely contemporary with oven F.4103. The small hearth was cut by a circular pit (F.7998), which was filled in with fine and pure clay, (32393). The function of the pit is unclear, although it may have held a cache that was emptied. The pit in turn was cut by another smaller pit, F.7997, which contained remnants of a basket, (32373), that carbonized from the conflagration of the building. There was no evidence that the basket contained anything. Floors (32348) were also cut by a post-hole, F.4101, at the southwest corner of the quadrant where the first oven of this area used to be. A shallow basin, F.4108, was located immediately in front of oven F.4103. The fills (32525) and (32345) were compact and homogenous. The basin was truncated by F.7988.

Further, a curved partition wall, F.7980, was constructed centrally to define the southwestern quarter of the quadrant. The western and southern ends of this curved wall, (30059), were truncated by later activities in the area. A number of floors were excavated within this area as ((32328), (32323), (30056), (30058), (30062)). Many of them were partial and heavily damaged from the fire that destroyed the building.



Figure 10. Cluster of ochre stones (photograph by Thaer Yartah).

Outside of partition F.7980, a number of patchy and heavily damaged floors were excavated as ((32333), (30069), (30063), (30075), (30076), (30084)). An oval pit, F.7988, cut floors (32333) immediately north of the oven/niche cut into the southern wall, also largely truncating basin F.4108. The function of this pit remains unclear, although it may be associated with partition F.7980, or may be a post that was used to support an upper mezzanine. Its fill however, contained a large number of charred botanical remains such as barley seeds. There was no evidence of charred timber, which would have given the pit a structural function. A corresponding pit, located at the eastern end of partition F.7980, which has not yet been excavated needs to be investigated next season to aid the understanding of F.7988.

Above floor (30069) was a cluster of ochre stones (Fig. 10). The ochre stones were placed a later phase in the life-history of B.131, and may correspond with the painting of the eastern platform and walls in red. Further excavation and post-excavation analyses need to be conducted in order to understand the detailed phasing of this area as well as the building itself.

Division F.7990

Division F.7990 runs on a north-south axis across Sp.500, defining the eastern edge of the western activity areas and likewise the western edge of central activity areas (Fig. 11). It is placed centrally, in relation to the building's entire proportions. Division F.7990 likely incorporated posts F.7970, F.7960 and F.7959 that are located centrally and correlate with the constructional phase of the building as well as engaged post F.7972 by the southern wall. Unlike other division-like features such as curtain walls, no light bricks were found around F.7990. Neither was much burnt rubble that had

imprints of lighter constructional plant materials. Such evidence was likely completely churned away due to exposure to elements after the destruction of the building, as another building was not built above it immediately (see below). Yet there was evidence of plaster floors lipping up the central posts that were in a fragile state of preservation. Also, floors located on the western side of the division abruptly end as if they also lipped up onto a light curtain wall that was truncated.



Figure 11. Posts and features related to division F.7990 and a mezzanine-like structure in Sp.500 (photograph by Katie Campbell).

Yet the possibility of a curtain wall extending through Sp.500 limit movement through the space: one would have to move through the north western platform and over the bench to get from the western half of the building into the eastern half. Could a curtain wall be a later addition to the puzzle, where the western and the eastern half of B.131 were separated from each other intentionally? To further understand this issue, excavations need to resume in Sp.504. Regardless of whether the curtain wall was a later modification, the posts that make F.7990 may have also acted as support for a mezzanine level. The placement of other posts such as F.7975, F.7991, and F.4101 may have also been related to such a mezzanine. There are traces of other post-like features that have not yet been excavated in the area. Their excavations in the following season should reveal more information on this division and the use of space in B.131.

Southern platform F.7951

Platform F.7951 extends about 1.3m east-west and 1.7m north-south immediately east of division F.7990. It is defined to the north by a ridge that extends to the limit of the southeastern quadrant. Platform F.7951 is divided from this area by partition F.7979. Its southern boundary is defined by

niche F.4109, and engaged pillar F.7972. Last season an extremely burnt surface, (22646) was excavated from this area. This season, excavations ended as the constructional makeup, (32329) of this platform was reached. A badly damaged burial of a neonate, F.7987 (Sk (32321), fill (32320)), was excavated from the northwestern corner of the makeup. A cut could not be located. A number truncated floors were excavated from the western edge of the platform, in stratigraphic order from earliest to latest as ((32500), (32316), (32317)). These, as well as the neonate, were sealed by partial floor surface, (32315), which may have been contemporary with plastering event (30054) that seals a part of the superstructure of hearth F.7957 and platform F.7981.

Southeastern quadrant

The southeastern quadrant of Sp.500 (Fig. 12) covered an area that extended about 3m east-west, and 1.65m north-south. The primary oven and hearth of the building were located here, as well as the main entry ladder. The earliest phase of occupation reached here is defined by floors (32389), that extend across the entirety of the area currently remaining *in situ*, abutting entry platform F.7954. An earlier formation level is seen through profiles within small cuts or disturbances in the area, and may be contemporaneous with an oval ended protrusion, (32380) located at the central southern part of the floor. This protrusion deposit may be associated with an earlier oven.



Figure 12. End of the season overview of the southeastern quadrant (photograph by Jason Quinlan).

Hearth F.7957 (Fig. 13) was established at the northwest corner of the southeastern quadrant above floors (32389). Two bricks placed within mortar, abutting partition F.7979 mark the western edge of the hearth. After an initial plaster lining, (30080), a silty clay superstructure abutting the

brick wall was built in two phases ((30057), (30060)) to define the rectangular edges and the circular interior of the hearth. Two small (0.04 x 0.03m) rectangular stake holes were recorded on the south-eastern corner of the superstructure. Unit (30064) represents the first floors of use as a thick plaster layer with clear scorching. The wear of the floors show that the eastern edge was likely the opening through which the hearth was accessed. A layer of makeup (30051) seals these floors and may be associated with a completely raked out floor. At this stage, perhaps once the floors were raked out, the superstructure of the hearth was repaired and renovated with sandy clay (30050). Then the central circular area was covered with an ashy makeup ((30048), (30049)), which was sealed by baked floors (22672), excavated in 2015.



Figure 13. Overview of hearth F.7957, oven F.7953, and platform F.7981. Facing southeast (photograph by David Fallon).

The use of hearth F.7957 correlates with the use of oven F.7953. The oven was constructed above the same horizon, immediately above the remains of another possible earlier oven, (32380). Partially cut into the southern wall, oven F.7953 was circular in plan extending about 0.8m in diameter. It was built upon a thick rubble base, (32379), that contained burnt superstructure, which may be associated with an earlier fire installation. Once the superstructure was shaped, the base was continuously used, forming a finely laminated thick base that was excavated as (32375).

The hearth and the oven were connected to each other with the construction of a small platform, F.7981. Before the platform was built, the southern wall was slightly cut back and the floors west of the oven were covered by a thick sandy clay deposit, (32366), that remains *in situ*. Further excavation of this deposit is required to understand its stratigraphic placement. This thick makeup was administered with bare hands while wet and malleable, evidenced by the fingerprints across



Figure 14. Fingerprints across makeup layer (32366) that fan outwards (photograph by Jason Quinlan).

the entire deposit (Fig. 14). A series of makeups and plastering events ((32346), (32327), (30087), (30054), (30055)) built up the platform that extends about 1.2m north-south and 0.8m east-west. Many of the plastering and repair events taken place here such as (30054) and (30055) subtly extend to the hearth, stratigraphically connecting the two architectural elements.

Floors (32389) were sealed by floors (30096). A small pit, F.7989, about 0.20m in diameter cut (30096) immediately east of hearth F.7957. This pit contained the remains of fuel refuse and may be considered to be a scoop. The pit was sealed by a thick plastering event (30074), that abutted platform F.7981. Another pit, possibly associated with the entry of the building cut (30074) and was excavated as F.7955.

Entry platform F.7954 seems to have been a rather stable feature in the area. Nevertheless entry ladder pit F.7964 underwent a number of repairs that have all been excavated separately. The earliest cut for the ladder, (32317) was circular, located at the edge of the platform by its concave turn. This pit was reinforced with cut (32310). Then the main ladder moved further east with cut (32304) and stayed here until the abandonment of the building.

Eastern platform F.7952

Of particular challenge this season was the excavation of the burials within eastern platform F.7952. Last season burials F.7961 to the north and F.7963 to the south were only partially excavated. Due to time restraints, F.7961 was again not fully excavated this season. Instead, focus was given to the F.7963. It became clear that in fact in the central and southern end of platform F.7961, two different burial events (F.4110 and F.7963) that belong to two separate individuals disturbed at least three,



Figure 15. Work in progress photo of F.7963 and F.4110. Facing south (photograph by Jason Quinlan).



Figure 16. Textile remains from burial F.4410 (photograph by Jason Quinlan).

possibly four adults (inferred by cranium count) that had already been buried inside the platform (Fig. 15).

The excavation of burial F.4110 has not been completed and there may still be elements of F.7963 remaining in the field. The burials in platform F.7952 have been extremely challenging archaeologically due to the brittle conditions of the bones. This is most likely due the conflagration of the building. Further, disarticulated non-long bones of the individuals from the previous burials were scattered above both burials, completely covering them. Further, the cut for F.4110 was obscured due to the fire, and until the primary skeletons of both burials were exposed, much of the fill above the two burials was excavated as one context, (22678).

Burial F.4110 (fill (32390), Sk (30040), cut (32545)) was the earliest interred burial so far uncovered and still remains *in situ*. It is placed exactly in the middle of the platform. It is a tightly flexed burial of an adult buried in an east-west alignment with its head to the west, feet to the east, facing north. The fill of the burial, which contains a high marl content, represents a unique practice. The nature of the marl and the subsequent burning of the building seems to have aided in the preservation of textile, found around the sacrum and pelvis (Fig. 16). The textile remains are thought to be of linen. It is possible that the burial of skeleton Sk (30040) cut into a previous burial represented by a red painted cranium Sk (32330). This cranium remains *in situ*. The stratigraphic relationship between these two individuals can only be determined after excavations in the platform resume.

The interment of Sk (30044) that belongs to burial F.7963 partially cut burial F.4110 and disturbed three other adults buried within the platform that were piled around the primary skeleton before the burial was filled. Skeleton (30044) was buried, similar to the previous burial discussed, in a tightly flexed position oriented east-west with its head to the west and feet to the east (Fig. 17). However, the body was laid on its back, and the individual was facing its chest. Its forearms were laid upon its ankles. A chert blade (30044.x1) was found by its right forearm. As noted above, during the interment process the long-bones of the previous individuals were piled to the southern face of cut (22681). Three crania, (Sk (30043), Sk (32322) and Sk (32369)) were also found within the cut. Of these, (30043) contained a quite a bit of carbonized brain tissue.



Figure 17. Primary skeletons of burials F.7963 (to the left) and F.4110 (to the right). Facing west (photograph by Jason Quinlan).

Space 556

The dominant feature in Sp.556 is burial F.7962. During the 2015 excavation season this burial was partially excavated, revealing a number of disarticulated subadult remains, including crania alongside four wooden objects. This season saw the completion of this important interment context. In fact, excavations revealed that the burial platform was likely used more than once, and that the final burial was for an adolescent aged about 15 years at death. The individual, Sk (31705), was tightly flexed buried in a north-south orientation with its head to the north, facing west. In total, five other subadults were found above the primary skeleton. Three wooden objects, carbonized from the building's conglomeration, were found immediately above the chest area of the primary skeleton. This burial context also revealed the remains of orangish brown organic material seemingly outside of the bones, as if it represented the remains of a hide-like material that wrapped the body. Similar traces have been found in the primary burials within platform F.7950.

Concluding notes

In our final excavation season next year, focus will be put on entirely excavating Spaces 500 and 556. Further, excavations will continue in this area to understand the nature of deposits beneath B.131. This task is particularly important in order to complete the dating program of the North Area.

Building 132

(with Arkadiusz Klimovicz)

Excavations undertaken in 2016 within B.132 concentrated exclusively on its main room assigned as Space 531. The initial aim of completely excavating this space was unfortunately not accomplished due to abrupt site closure. Judging from the stratification seen through the sections of various cuts such as post-retrieval pits and burials across Sp.531, only half of the occupational sequence was excavated and recorded this season. This work revealed nuances in the use of space through the building's life history as well as its changing internal configuration.



Figure 18. Overview of Sp.531 about half-way through the excavation season. Facing east (photograph by Jason Quinlan).

Similar to other Çatalhöyük houses, the main room of B.132 contains platforms, a bench and an overall north – south division in the use of space. However, unlike other Çatalhöyük buildings, these larger architectural divisions are gradual and defined less formally. The southern end of the space is dominated by ovens and hearths that changed location through time. The western end of this area contains platform F.7880 which acted as a passage to the southern side room, Sp.511. The central floor was surrounded by platforms to the northwest (F.7733), and east (F.7734) that abutted walls and another platform to the west (F.8321) whose western boundary is unclear. Further another platform, F.7723, was located to the northwestern corner of the room, whose western extent is again, unclear. This platform (F.7723) was the highest platform in the space, however it was mostly destroyed with the removal of three posts within or near its boundaries during the abandonment of the building. A short step distinguished it from northern platform F.7733. A western platform,

F.8321 was located centrally, although its western end was also destroyed during the abandonment of the building. The northeastern corner of the building was partitioned from the rest of the space with the placement of a number of posts, columns, and eventually a curtain wall. The most defined platform was eastern platform F.7734, which was abutted by bench F.7879. The eastern end of the bench was largely destroyed during abandonment due to the removal of posts, which would have abutted the eastern wall.

Due to the large open space, a number of modifications needed to be made to the space in order to maintain the roof. For example an eastern support wall abutted the original eastern wall. All of the excavated deposits postdate the construction of eastern support wall F.7736.

The southern activity area

The southern activity area is characterized by dirty floors, numerous fire installations and other features relating to food processing (Fig. 19). It encompasses an area about 5.5m long and 2m wide. It is undoubtedly the most complex and heavily used area of the space with its overlapping floors and shifting features.

The southwest corner of this area is slightly raised and acts as a passage to Sp.518. This platform, recorded as F.7880, would have been almost 1.8m long and 0.8m wide in the Neolithic. It was largely truncated, particularly at its eastern end during the abandonment of the building. The plastered head wall installation (21666.x1) would have been facing down onto this platform. The remainder of the southern activity area is separated from the western platform and central floors by a gradual slope and the eastern platform by bench F.7879.



Figure 19. Overview of the southern activity area at the end of the excavation season. Note that oven F.7732 dominates the area centrally. To the far right of the photo is oven F.8318. Facing south (photograph by Jason Quinlan).

The southern activity area contained two ovens during the earliest occupation phase uncovered this season. Oven F.7732 was cut centrally into the southern wall of Sp.531. It contains at least four baked floors, the latest being (32010). Oven F.8318 is located on the northern end of southwestern platform F.7880. Despite the location of the oven, platform F.7880 had relatively clean floors (32713), while the lower activity area contained 'dirty' floors typical of intense activity areas (32714, 32707). All of the features and contexts discussed above remain *in situ*.

Oven F.8318 was eventually sealed by (32073) which actually represents a number of different floors. These floors were best preserved at their southern end, where the deposit reached 0.07m in thickness and displayed at least ten different plastering /use events.

A circular hearth that was about 0.75m in diameter was cut into floor (32707) immediately northeast of oven F.7732, centrally in the southern activity area. The hearth henceforth became the most stable feature in this region. Its first rim construction was from a silty clay (32703 and 32098), and was repaired a number of times through the occupation of the space. Much of its floors were actually raked out through its use. The intensity of its use is evident through the number of repairs it went through, such as (32064), (32017), (32013) and (31551) from earliest to latest.

Immediately after the hearth was formed, a clean white plaster (32704) that partially extended from the bench covered the eastern end of the southern activity area. A small scoop, F.8316, was formed due to compression rather than active cutting at the eastern end of floor (32704). This scoop-like depression was filled with an ashy fill, (32705), and then sealed by dirty floors (32070). It is worth noting that the makeup of eastern floor (32070) was laid much thicker where the scoop was, as if to even out the concavity it formed.

At the same time the hearth was cut into floor (32707), pit F.7744, 0.34m in diameter, was cut into correlating floors (32714) at the western end of the southern activity area. The shallow cut (32067) was 0.07m deep and contained an ashy fill with a bit of animal bone. The function of the pit is unclear. This pit was sealed by dirty floors (32071), which in turn were sealed by plaster floor (32069). This clean plastering event took place only around the oven and coincides with the oven F.7732 being turned into a niche, F.7855. The dark orange sandy makeup, (32009) that used to cover up most of the oven's surface overlapped onto the clean plaster surrounding the oven. (32009) contained traces of carbonized plant remains that could have been fuel left behind as a special deposit after the very last fire event occurred within the feature.

Floor (32015) lipped up makeup (32009) and directly sealed dirty floor (32070) by the eastern end of the southern activity area. (32015) represents at least three plastering episodes. During the use of these floors, a new oven (F.7737) was established immediately east of the older one, again cut into the southern wall. The cut of the oven was recorded as (32028) and (32044). Once the cut for the oven was made, fragments of a fire installation were re-used as the makeup of F.7737, recorded as (32027). Then the badly truncated superstructure of the oven, (32026), was built. Immediately after the partial dismantlement of oven F.7737, the spot was used shortly as an extensive fire spot (F.7741) (Fig. 20). It comprised of burnt layer (32025) recorded within cut (32029) and seems to belong to the use of an open fire without a restricting structure. Oven F.7854 was then established in the same area. The cut for the first oven in this area was used as part of the dome. A substantial superstructure (31569) outlined the oval oven that extended 0.9m in the latest phase of use in Sp.531.

Above the floors that sealed pit F.7744 immediately north of the niche a circular bin was constructed encircling cut (31538). The edges of the circular cut were shallow although towards the center its depth increased (from 0.01m to 0.19m) and formed a concave base, as if imprint of a post



Figure 20. Fire spot F.774I next to niche F.7855. Facing south (photograph by Jason Quinlan).



Figure 21. A focused overview of the southern activity area. To the far left oven F.7854 and next to it niche F.7855. To the front left hearth F.7871, centrally bin F.7867 and to the right oven F.7868; view south (photograph by Jason Quinlan).

placement. The rim of the bin was constructed in two episodes represented by (32021) and (31546). No remains could be recovered to infer the function of this bin-like structure, which may have temporarily acted as a post. Floors (32068) to the north and east of the correlate with its use.

Shortly after the construction of bin/post F.7867 immediately to its west (Fig. 21), another fire installation was placed centrally within the southern activity area, above the aforementioned floors. This oval fire installation was 0.9m long and 0.55m wide and aligned east-west. Its superstructure (31548) was truncated during the abandonment of the building. Its baked base (31547) was set on top of orangish brown sandy clay foundation (32065). The shape and extent of the fire installation's base, the thicker superstructure construction to the east, and a thicker base at its western end suggest that in fact the fire installation was a free-standing oven with an opening to the west. The use of this oven was likely contemporaneous with hearth F.7871 as well as oven F.7854, towards the end of the occupation of Sp.531.

To the northwest of oven F.7868, cutting the final occupation surface of Sp.531, (31540), that extended beyond the southern activity area towards the eastern platform, central floors, the northern platforms and the western platform, were two similarly sized scoops next to each other, F.7731 and F.7730. Preliminary phytolith analyses in the field suggested that these cuts may have been used for dehusking before they were filled with ashy deposits, (32598) and 31596) respectively.

Bench F.7879 and platform F.7734

Bench F.7879 is an integral feature of Sp.531, and was repaired and re-plastered a number of times, resulting in an increase of its volume through time. During the abandonment of the building, its eastern end was completely truncated. Judging from the double post retrieval pit F.7872 (see below), it incorporated an engaged post, which abutted the original eastern wall F.7149. Then, after the construction of support wall F.7736, it incorporated another engaged post, which abutted the support wall. A number of plastering events were recoded on the bench sequentially from the earliest to the latest as (32082), (32049), (32041), and (31566). These events have been correlated with other maintenance episodes across the space.

Western platform F.7734 at its earliest phase, extended about 2.1m north-south and 1.8m east-west. It was truncated at its northwestern corner by burial F.7634 that belonged to Sp.602 and northeastern corner by post-retrieval pit F.7870. The earliest deposit uncovered here is a makeup layer (32708) that remains *in situ*. This was covered by a thin white plaster floor, (32089), which represents the same plastering event with (32700) that remains *in situ* covering bench F.7879. Floors (32089) were in turn sealed by a grey makeup layer, (32083), which seems to be contiguous with application of makeup (32084) on northwestern platform F.7733, based upon its color, texture and composition.

After the application of makeup (32084), a circular shallow pit was cut into the platform (F.7747). This pit, which was truncated by a later burial (F.7739, see below), had an oval cut 0.75m long, 0.6m wide and 0.10m deep. Its fill (32088) consisted exclusively of baked floor and superstructure fragments that must have belonged to a fire installation that had been demolished. Both makeup (32084) and fill (32088) were sealed by thin plaster floor, (32075). Pit F.7747 serves no structural purpose (Fig. 22). It is important to note that its peculiar fill may actually represent a commemorative event.

The next series of modifications slightly reduced the size of the western platform by limiting its northern end where curtain wall F.7735 (32074) was constructed (see below for further discussion on the curtain wall), directly on top of (32075). Judging again from the color, texture and composition of the building materials as well as the stratigraphic relationship to (32075), the construc-



Figure 22. Fill (32088) of pit F.7747, cut by burial F.7739. Facing east (photograph by Arek Klimovic).

of this curtain wall is likely contiguous with (32077), a thin support element extending about 1.3m north-south abutting eastern wall F.7736. The full extent of this element is also unknown due to truncations that took place during the abandonment of the building.

After the construction of the curtain wall and support element, a thick layer of beige plaster floors, (32053), were laid above the platform extending into the central floors. These floors were cut by burial F.7739, which belonged to a sub-adult, aged 10 years. The skeleton, Sk (32045), was buried in a tightly flexed position oriented east-west with its head to the west and feet to the east, facing north. Cut (32039) was lined with a continuous layer of white residue that had traces of red ochre spots. The residue and spots are thought to represent some form of organic material, possibly a hide, that may have actually been stamped. Similar white traces were found around the extremely fragile bones. Further, a small lump of plaster-like white mineral was found above the cranium of the individual, also containing traces of red pigment.

Fill (32040) of burial F.7739 was sealed by an irregular patch of grey sandy silt, (32038), that was darkened in color due to heat exposure. The lack of carbonized plant materials suggest that the activity area was exposed to heat through objects that had been heated, possibly clay balls. This activity area was sealed by (32042), which represents two successive plaster surfaces and their respective makeups excavated as a single unit. Stratigraphically the latest archaeological event on the platform was occupation surface (31540), which extended into the central floors, towards the southern activity area and was even represented on the northwestern platform.

West-central platform F.8321

Platform F.8321 is roughly 1.5m x 1.3m in shape. It is not as defined as the eastern platform its western end was completely destroyed by post-retrieval pit F.7873 (see below) during the abandonment of the building. It seems to have partially extended to the western wall before the wall doglegged further west. The earliest floor exposed, (32701), remains *in situ*. This was sealed by (32081), a patchy white plaster floor and its grayish brown makeup. (32031) in turn covers the entire platform, and represents a patchy white plaster with its corresponding makeup and a second grayish brown plaster/makeup. No specific activities traces were found on this relatively clean platform.

Central floor and northern platforms

The central area and the northern floors and platforms represent the 'clean' activity spaces of Sp.531. As noted in the previous year, the northern limit of the western wall of the space is not defined. Nevertheless, a small platform, F.7722, would have abutted it. The current extent of the platform is 1m east-west and about 2m north-south, although its southern boundary cannot be exactly defined due to the truncation that took place during the abandonment of the building (see below). A larger, and slightly lower platform is situated immediately to its east, platform F.7733, extending 1.4m east-west and 2.3m north-south. The southern ends of both platforms were truncated by post-retrieval pit F.7873.

East of this was another 'clean' area, extending 3.3m east-west and 2m north-south. A number post retrieval pits also heavily truncate this section (see below), and there is no clear ridge that defined it from the central floors, or from eastern platform F.7734. However, post-retrieval pits F.7874 and F.7870, and curtain wall F.7735 are in an alignment that most likely formed a boundary. The question of when the posts were actually set will be impossible to answer due to Neolithic truncation. However, it is important to note that these post retrieval pits correlate also with two columns (see below).

In the earliest occupation phase so far revealed, the central floor area was covered with a white plaster, (32090), that extended northward abutting the northern wall and column F.7727, and on to northern platform F.7733. This deposit currently remains *in situ*. At this phase of use the northeastern activity area was not clearly defined. Column F.7727 was a central feature and also remains *in situ*. Another column, F.7726, abutted the northeastern corner of the eastern support wall. Both columns were likely constructed at the same time as they are made from the same construction materials: orange clay, a grey silty mortar, and peculiar fragments of re-used plastered elements (possibly pieces of a wall installation that actually look like column heads found much later on site, such as those in B.79). Column F.7726's original shape can't be defined due to its truncation, again, during the abandonment of the building.

On platform F.7733, two cuts that are likely burials (F.8319 and F.8320), truncate (32090) and have not yet been excavated. These burials and floor (32090) were sealed by floor (32099), which was in turn cut by burial F.7748. Burial F.7748, (fill (32092), skeleton (32097), cut (32091)) belonged to an infant buried in an upright sitting position with its hands underneath its feet, facing north. This burial was sealed by a thick grey makeup, (32084), that extended the platform slightly eastward. (32084) was, in turn, sealed by three white plaster floors and their makeups excavated as a single unit, (32076). Unit (32076) was contemporaneous with (32080), floors excavated in the central and northern activity areas representing the last instance in which the central floors and the northern activity area were connected (see below). Burial F.7738 cut into (32076). Skeleton (32043) belonged to the primary burial of an infant. This was actually one of the latest events that took place in the space, sealed by a thin white plaster floor, (32020).

Curtain wall F.7735, which was constructed from a grey sandy clay, (32074), ran between post-retrieval pits F.7874 and F.7870 (Fig. 23). Its western end sat above northern platform F.7734 (see above). It is possible that the posts associated with the post retrieval pits were established at this point. This will be a question impossible to answer, although it is likely that these posts represent primary architectural elements associated with the roof or a mezzanine floor that was set up above the northeastern corner of the building. The curtain wall had one repair episode, recorded and excavated as (32051). This was a marl-rich deposit that supported the northwestern edge of the curtain wall. The curtain wall was heavily damaged during the abandonment of the building, and later truncated by a burial cut from Sp.602.



Figure 23. Curtain wall F.7735. Facing southeast (photograph by Arek Klimovic).

Above floors (32080) was a thick beige makeup layer with a corresponding fine white plaster surface, excavated as (32033). This makeup extended onto the eastern platform, F.7734. It overlapped the lower part of the curtain wall and also continued towards the west and northwestern platforms. (32033) was truncated by a peculiar pit, F. F.7740 by the central floor area, in the middle of the space. The pit had a circular cut, (32047), about 0.5m in diameter, 0.4m in depth with a bell-shaped outline. The upper part of its fill, (32046) composed of a compact silty deposit while the lower part was exclusively ash. Preliminary analysis by specialists show that the ash contained chaff, grain, weeds and some pulses. The different botanical remains show seasonal variety, suggesting that the ash was an accumulation of different activities. The placement of the pit suggests that it may also have been the location of a structural post, whose location eventually changed. In fact, pit F.7875, located

at the southwestern corner of the central floor also cut (32033), suggesting that the post standing in (F.7740) may have been moved here at this time.

Before the final occupation surface (31540) that extended throughout most of the space, floors (32032) represent the last episode of plastering in the central area and correlate with (32020) by the northwestern platform, which sealed burial F.7738 (see above).

The post-retrieval pits of Space 531

During the abandonment of B.132, a number of structural posts were removed from the building. This caused the truncation of many of its features. The location of the retrieval pits and the shape of their cuts have shown where the posts would have been positioned (Fig. 24). And in some cases, post impressions within the cuts have actually revealed not only the exact position of the posts, but also their size in terms of their circumference.



Figure 24. The post retrieval pits and respective posts within Sp.531. Post-retrieval pits are marked in purple while the post impressions are darker (orthophoto by Jason Quinlan).

The largest post-retrieval pit was F.7873, (cut (31554), infill (31555)) located at the western end of Sp.531. While it extends over 2m north-south and almost 1.5m east-west, its full extent is unclear since the limit of this end of the space sits beneath a different building. The retrieval pit represents removal of at least four separate posts, which were recorded as three different cuts ((31592), (31594), (32000)). Cut (32000) contains the impression of two posts at its western end. It is unclear if these posts were structural or whether they were a part of a number of a mezzanine structure that covered the northern end of the building. Given their placement and size, both scenarios are likely. The northern two cuts (31592) and (32000) are in alignment with two other post retrieval pits further east in the space, which seems to support the possibility of a mezzanine level in the northern half of Sp.531. The three posts placed at the western end of the cut may have acted structurally, or they could have been a part of a division. Unfortunately interpretations remain limited due to our lack of understanding of what took place at the western end of Sp.531.

Immediately north of F.7873, abutting the northern wall of Sp.531 was post-retrieval pit F.7723 (cut (31579), fill (31578)). This post retrieval pit also represents the removal of at least three posts, one that was a flat timber that abutted the northern wall. This was an engaged post, as seen through the post scar on the wall. The other two posts seem to have been free-standing circular posts that were smaller in size. Their function remain unknown.

Post retrieval pit F.7724 (cut (31580), fill (31581)) was located near the northeastern corner of Sp.531. It was an irregular cut that extended 1.7m east-west and 1m north-south at its widest edges. The cut contained an oval impression of a post about 0.15m south of the face of the northern wall. Immediately east of this impression was cluster (31585). The cluster contained six pebbles, 32 obsidian flakes, 17 shells, some animal bone, a bone point, and bone spoon. Two more post retrieval pits were found at the northeastern corner of the building. Post-retrieval pit F.7725 (cut (31582), fill (31583)) truncated the eastern support wall as well as much of column F.7726. The cut revealed two oval post prints very near the original eastern wall of B.131. Given that the support wall likely covered the two posts during the use of the building, quite a bit of effort was executed to reach them during its abandonment process, which is seen through the truncation of a number features in the area.

Post-retrieval pit F.7870 (cut (31544), fill (31543)) was located slightly south of northeastern corner of the building. The cut revealed a single oval post very near the support wall. This post seems to be in alignment with the post-retrieval pit F.7874 (cut (31556), fill (31557)) which is located centrally between the northern activity area and the central floors. A curtain wall, F.7735, runs through pits F.7870 and F.7874, indicating that the posts here may have been connected to each other through a light pisé-like construction.

Another large post-retrieval pit was excavated at the eastern end of bench F.7872. This pit represented the removal of two separate posts that belong to different constructional phases. The easternmost post was the original engaged post that connected the bench to the eastern wall. However, once support wall F.7736 was built, this post was buried and another post was placed again in line with the bench, as an engaged-post abutting the support wall. The excavation of this post-retrieval pit revealed some practical evidence on how these posts were removed. The thin wall between the post shows that the Neolithic settlers likely shook the posts back and forth after digging them partially to loosen them from their ground. In the case of this context, this process allowed the survival of a thin section of the support wall in between these posts.

The final post-retrieval pit that belongs to the abandonment of the building is post-retrieval pit F.7881. This pit may represent the entrance to B.132.

Concluding notes

The floors, particularly the dirty ones, of the building were sampled extensively in a grid during excavation to be able to differentiate different activities. Further analysis by specialists may be able to reveal seasonal variations in certain contexts. An extensive occupational sequence remains to be excavated the following season. But already, it is clear that there is an underlying building beneath B.132 that was likely its predecessor. Stratigraphically, B.132 represents the earliest occupation revealed in the North Area. The aims for next year will be to complete the excavation of the entirety of the space in order to reveal enough deposits from the building below that can be safely dated for the North Area dating sequence.



Figure 25. Grid map for Spaces 85 and 610 (plan by Justine Issavi).

External Spaces 610 and 85

(Justine Issavi, Stanford University)

This multi-phase external space is located within a cluster of buildings in the North Area of the East Mound. Currently, Building 119 delimits the open space to the north, Building 131 to the east, and Building 114 to the south. Building 3, already removed by the BACH team, bounded this space to the west. Space 85 currently refers to the contexts deposited after the construction of Building 129. Space 610 occupies the same spatial boundaries as Sp.85 but refers to the deposits predating the construction of B.29. Space 85 was first defined in the 1993-1994 surface scrape. In 2000 it was partially excavated by the BACH team, along with B.3 and Sp.87, Sp.88, and Sp.89; because it was excavated in isolation, it is tentatively attributed to the chronological Level North G.

Aims and methodology

The excavation that took place in this space by Justine Issavi is a component of a larger dissertation project that focuses on the organization, development, and use of external spaces at Çatalhöyük within the wider context of

the Anatolian and Near Eastern Neolithic. This dissertation project asks the following interrelated questions: are external spaces at Çatalhöyük used communally? Is there a temporal shift in the nature and/or use of external spaces at Çatalhöyük? If so, do such changes correlate with other noted trends in the Çatalhöyük and the broader regional sequence? Communal external space for this project is defined as a space used, occupied, modified, and/or maintained by members of a neighborhood or community (two or more houses) that is not roofed by an architectural structure. A multi-pronged approach has been deployed to systematically investigate open or external spaces

at Çatalhöyük through the analysis of frequency, size, composition, and distribution of external deposits, lenses, clusters, artifacts, features, and spaces utilizing archival research, statistical and spatial analyses, material analysis, and the excavation of a large external area.

The excavation and recording methodologies of Sp.85 and Sp.610 were built on methodology currently employed by the Çatalhöyük Research Project. However, the resolution for the excavation of middens and external spaces is typically coarser than that of the resolution for the excavation of houses and occupation deposits, as small-scale dumps in middens are generally grouped and excavated as one unit. In order to mitigate this and investigate external spaces on a finer scale, a 1x1m grid was imposed on the excavation area (Fig. 25). The sampling strategies also reflected that of ÇRP, and while contexts were excavated stratigraphically, additional samples were taken for archive, flotation, and phytoliths in 1m grids. Furthermore, if a certain unit or context had a depth of more than 0.15m, it was taken off in arbitrary spits (of 0.15m) and sampled, allowing the retention of a degree of spatiotemporal control on the more homogenous units (such as large dumps) in these spaces. Similarly, artifacts—although associated mainly with the context that they were recovered from—also were associated with grid numbers and spits, allowing detailed volume/areal density analyses to be conducted during the post-season. The initial goal at the beginning of the 2016 season was to prioritize all excavated contexts (and samples) in order to receive immediate feedback, however, given the strict time schedule and limited resources this was later revised and thus only select units and samples were prioritized for immediate analysis.

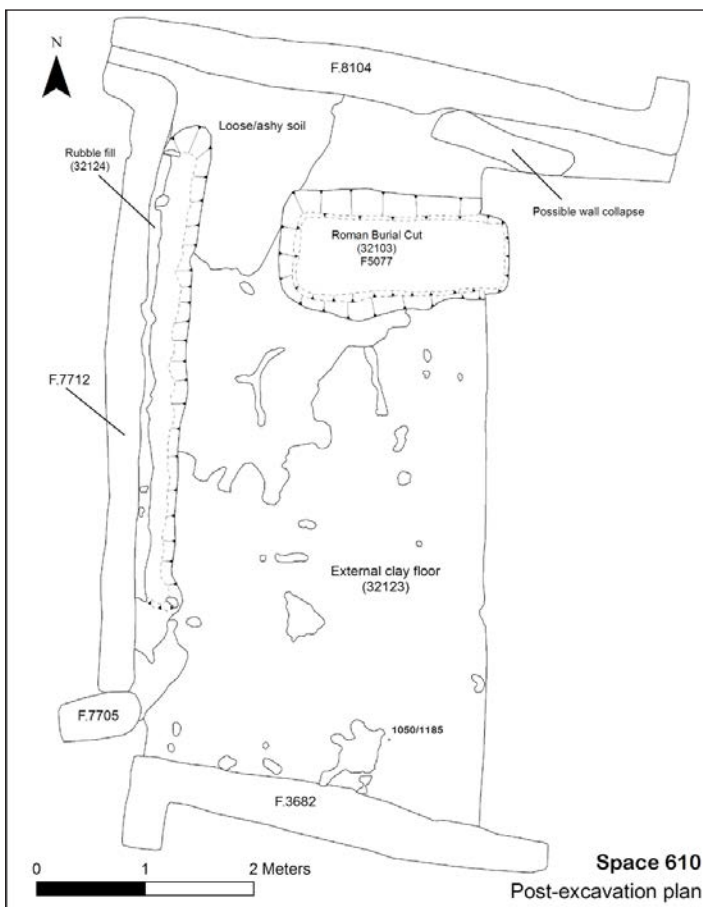


Figure 26. Post-excavation plan of Space 610 (plan by Justine Is-savi).

Space 610

The earliest exposed but unexcavated deposit in Sp.610 is the rubble fill (32124) belonging to the foundation cut of Building 131's eastern wall, F.7712 (Fig. 26). The currently visible portion of the fill is located along the westernmost edge of Sp.610 and measures 4.08m by 0.15m.

An external clay floor (32123), composed mainly of a light yellowish gray clay, is exposed and also unexcavated in the eastern portion of the space. The portion of this context that is visible in the east-facing section has a thickness ranging from 0.02m in the south to 0.04m towards the north. Although not plastered, this floor was distinct from other, perhaps less formal, trampled surfaces that have been observed elsewhere at Çatalhöyük and seems to have been laid in preparation for a variety of activities and could represent an active phase of the open space. Given that the composition of the floor had noted similarities to that of the bricks used to construct the north wall of B.114, F.3682, it is possible that this external floor coincided with the preparation and construction of B.114.

This external floor was sealed by a fire spot (32112), same as (32115), in the eastern part, as well as other fire-related activities such as a series of ash dumps (32121) to the southwest. The fire spot in the eastern part (32112), same as (32115), has an irregular shape (1.47m x 0.68m with a maximum depth of 0.02m in squares 8-9, and 11). It was initially recorded as two separate deposits but proved to be the same event. The clay surface below this fire spot was visibly effected, suggesting that this event represented a fire spot rather than the dumping of ash from another location or fire installation. Articulated sheep elements associated with the fire spot display charring patterns consistent with cooking, so some meat consumption activities may have taken place. Crop processing activities such as de-husking are also evident, however, the density of macrobotanical finds as well as their species varied spatially. The phytolith remains point towards a high-temperature fire and various fuels were used, though oak dominated. Additionally, evidence pointing to the burning of “waste” materials was also apparent within the faunal and macrobotanical artifact classes. Given this feedback, as well as the interdigitating nature of the deposition, it is likely that this ‘fire spot’ was actually composed of a number of fires set overtime to serve a variety of purposes. Unit (32121)—is a compound unit consisting of a series of ash dumps, measuring (1.89m x 0.78m with a maximum depth of 0.03m in square 11, 13-15). This context has been characterized as an ash dump rather than a fire spot for two reasons: first the clay surface directly below the deposit did not seem to be heat-effected, and second the deposition was highly irregular and seemed to be composed of a series of small ash lenses.

These activities were in turn sealed by unit (32114), a heterogeneous and extensive, charcoal-rich dump (measuring 5.36 m x 2.66m with a maximum depth of 0.35m). The context boundaries spread throughout most of Sp.610 (squares 1, 4-21) and thus varied in depth, as well as consistency due to differential trampling. The northern extent of the unit (squares 1, 4, and 7) was much more friable and ashy—probably due to modern trampling—with less depth (0.03-0.10m). The southern extent (squares 8-22) tended to be more substantial in depth (0.15-0.35m) and were more compact, especially in the lower 0.05-0.10m. The context consisted of compound layers with ash and charcoal lenses dispersed throughout. Some of the substantial lenses were sampled separately and sent to flotation (e.g. 32114.s35). Artifact concentration also varied throughout the context pointing towards a very heterogeneous and even long-term depositional process. In grids where the depth of the unit exceeded 0.25m, the context was sampled in spits (at every 10-15cm), and although the unit is marked as priority, only grids 12 and 13 were prioritized.

Space 85

The foundation of B.129's east wall was cut into (32114). The cut (32117) was irregular, oriented north-south, and measured 5.79m x 0.46m with a maximum depth of 0.40m. Five articulated elements from an equid neck (32116.x1) were found at the interface of the cut and the fill (Fig. 27). The fill (32116) of the foundation consisted of rubble containing a high frequency of raw clay inclusions, especially towards the south. In the north, the fill consisted of recycled construction material, such as broken bits of mudbrick mixed with mortar and fewer clay inclusions. Currently, it seems that the spatial boundaries of this foundation trench match what is visible of the earlier foundation fill (32124).

To the east a badly preserved clay surface (32113) seals (32114). It is difficult to identify the original boundaries of this context given its poor preservation, although in terms of consistency, composition, and depth, it is similar to the earlier clay floor (32123). This surface is sealed by a fire spot (32111), located in grid squares 11-12, 14-15, and measuring 0.93m x 0.77m with a maximum depth of 0.03m. The fire spot seemed to have a fairly irregular shape, although an animal burrow runs



Figure 27. Articulated equid neck (32116.x1). Facing west (photograph by Justine Issavi).

through the unit and could have contributed to the irregularity of its shape. In general, this fire seemed to be used for trash burning with some evidence for crop processing and de-husking. Some fish elements were recovered, but most faunal material seemed to be dumped in after the fact. Fuel used consisted of elm and almond but was mostly lower density (especially when compared to fire spot (32112)). Given that the clay surface beneath the fire spot was heat-effected, it is likely that the fire activity was *in situ*, however, the unit again seems to be comprised of interdigitating deposits, indicating repeated use through time.

Unit (32111) was sealed by mixed dump (32106), which has been rich in artifacts but also suffers from a large number of animal burrows and long-term trampling and exposure (measuring 2.99m x 2.43m with a maximum depth of 0.07m in squares 4, 7-15). This is the first unit in this space to be excavated and sampled according to the grid. In general, grid squares along the eastern edge of Sp.85 (squares 4, 7, 10, 13) were densest along most artifact classes-despite the small volume of soil, such as obsidian, faunal material, and botanical remains. Botanical remains pointed towards food processing activities, especially de-husking. Faunal material included mostly sheep-sized elements with some large equid/*bos* elements included and point towards secondary or tertiary deposits (discard activities). There is more burning of the faunal material towards the southeastern portion of the deposit. There are no formal chipped stone tools, and many of the flakes could also represent discard activities.

To the west, (32106) was partially sealed by an ashy deposit (32107) located near the western edge of Sp.85 and measuring 4.55m x 0.80m with a maximum depth of 0.03m (in squares 4, 7, 10, and 13). It was generally friable with a few charcoal inclusions. Archaeobotanical analysis indicates the presence of modern materials in this unit, which could be explained by substantial amounts of

trampling and exposure within the last decade. Units (32105) and (32101) were arbitrarily excavated deposits that sealed (32107). The long-term exposure, animal activity, and modern trampling had caused great contamination and a total of 0.20m was removed from the topsoil in order to reach a secure context. Similarly, 0.15m were removed (32100) from the east-facing section due to erosion.

Discussion

Given the abrupt end of the 2016 season, excavations and the material analysis of this area for now remain incomplete but are hoped to be completed in 2017. In terms of addressing the aforementioned questions regarding the communal use of space, further work is needed although some potential patterns are beginning to shine through (e.g. higher artifact density along certain building walls). As far as the more general goals of the project for the excavation of this area, which consisted of better understanding the chronological phasing of the North Area, some progress has been made, especially with the excavation of B.129's east wall foundations. The possible foundation cut for B.114's north wall—cut (32120), fill (32119)—can only be seen in section as of now and have not been excavated (Fig. 28). An in-between wall fill (32118), consisting of mixed rubble and midden-like material was excavated in the southwest corner of the space and confirmed that Buildings 114 and 131 were cut into the open space. A preliminary analysis of pottery and chipped stone material indicate that this space fits in with materials from Mellaart Levels VIII-VII chronologically; however, other relationships with surrounding structures have yet to be identified and await further excavation.

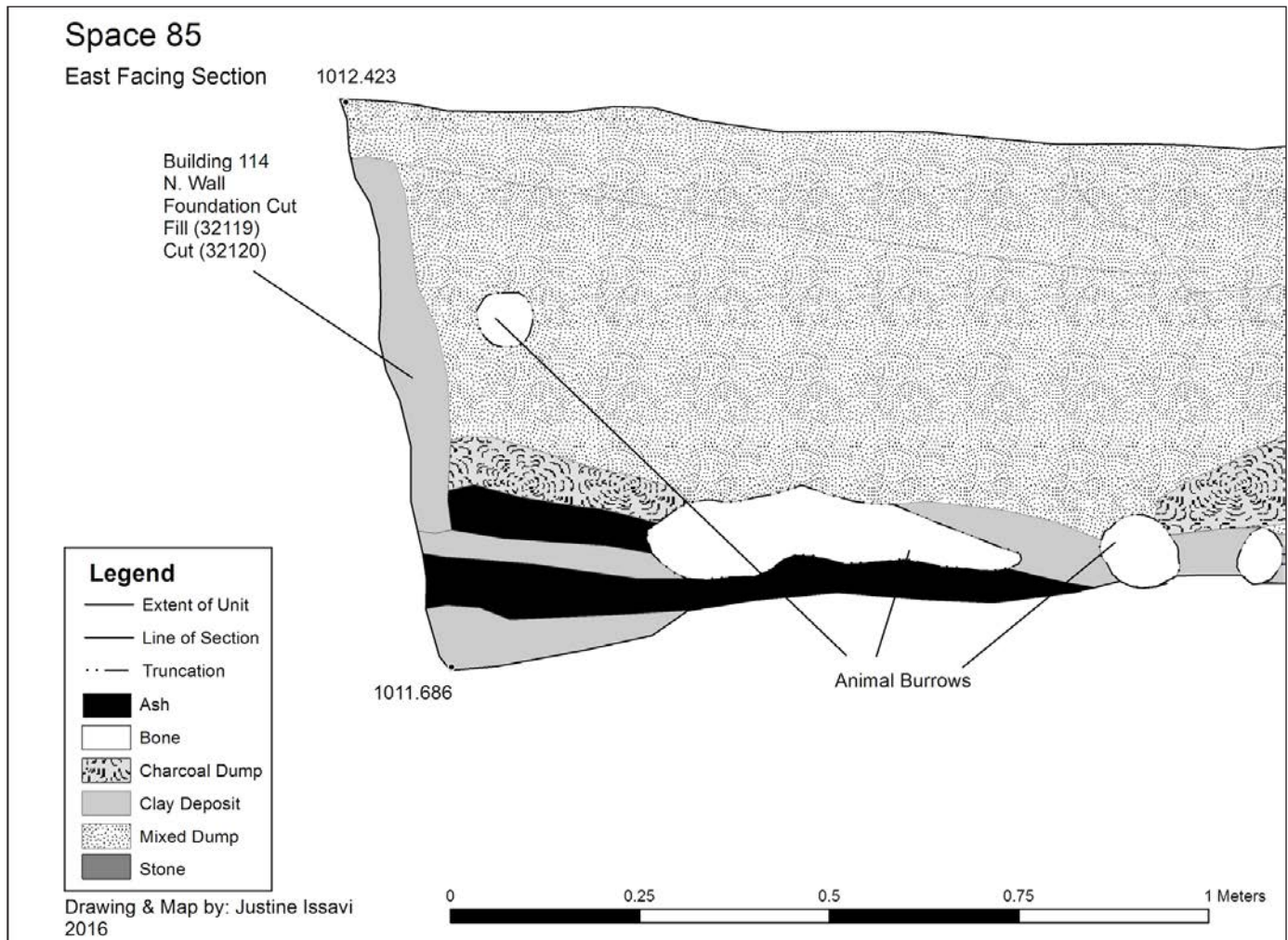


Figure 28. Foundation trench belonging to B.114's north wall as seen in section (section by Justine Issavi).

Post-Neolithic activity

An important post-Neolithic find this season was Roman burial F.5077, which cut through Sp.85. It is the primary burial of an adult female. This feature was visible in the section and highly disturbed by animal burrowing activity. The cut (32103) is oriented east-west, is rectangular in plan with sides that angle at 45 degrees at the top but become vertical. It has a relatively flat base that sloped slightly towards the southeast. The cut was sealed by a layer of charcoal (32122) that tends to be typical of burials of this period. The skeleton Sk (32104) was identified as an adult female, was associated with a number of goods and also suffered from poor preservation in parts (especially the cranium) due to the highly disturbed nature of the fill. The fill (32102) of this burial contained a high frequency of animal burrows and thus contained a large number of adult and juvenile (unarticulated) human bones, along with a mix of Neolithic and later materials. The body was placed in a supine position, oriented east-west in conformity with other Roman burials. Traces of wood and iron nails indicated that the body had been placed in a rectangular wooden coffin. There was reddish pink pigment by its neck, which could potentially be staining from a draped cerecloth. This skeleton was highly disturbed and damaged by animal burrowing activity. Nevertheless a number of grave goods were recovered with the burial (Fig. 29): a stone pendant; a glass unguentarium; a glass tear jar; one complete ceramic unguentarium and one broken ceramic unguentarium; one copper alloy box hasp; one iron fibula brooch; a broken glass bottle; a milled rectangular copper alloy plate; a pair of gold earrings textile; a copper alloy ear scoop; and two glass melon bead. All of these finds make this burial one of the richest Roman burials excavated at Çatalhöyük.



Figure 29. Closeup of one of the unguentaria found with burial F.5077. Facing north (photo by Jason Quinlan).

A note on the phasing of the North Area

The phasing of the North Area was established by Shahina Farid some years ago (Farid 2014). Subsequently excavated buildings have finally been placed within this phasing sequence as excavations have revealed more links between different buildings and spaces in the North Area. The following is a summary of how such assignments have been made. More discussion and work will follow these very preliminary observations.

Building 132 is currently phased to Level North E. This was accomplished through linking various buildings to each other. Of particular importance is B.131, as it ties together both the Buildings 1 and 5 sequence, as well as the B.77, Sp.102 and B.132 sequence. While the floor level of B.131 is substantially higher than that of B.77, it is an older building as the construction of B.77 directly cuts the southern wall and the ovens of B.131. Building 131 had to use the walls of a building so that the domes of the ovens could have proper support. Two scenarios are possible:

- Scenario 1: If the ovens of B.131 were carved into the walls of B.132, the use of B.132 and B.131 would have been at one point contemporary. And B.132 would have withstood the conflagration of B.131. No archaeological evidence of the conflagration of B.131 can be found within B.132, because the construction of B.77 would have truncated such evidence. Nevertheless, the construction materials used in the buildings do not seem contiguous. Neither does the material culture, although more post-excavation analysis is needed to confirm this.

- Scenario 2: After B.132 was abandoned, during the use of Sp.602 (the “burial ground”), walls would have been constructed to support the southern wall of B.131 for the construction of the ovens. There is wall construction in the area post-dating the abandonment of B.132 and pre-dating the construction of B.77. However, these walls were partially truncated by the construction of B.77, and have only been located at the northeastern end of Sp.602.

Nevertheless, due to the higher likelihood of scenario 2, Sp.602 is currently seen as contemporary with B.131, and B.132 is phased a level below these buildings. Furthermore, B.77 is assigned firmly to Level North G, while Sp.602 and B.131 have been assigned to Level North F. Therefore, B.132 has been assigned to Level North E (Table 1 and Fig. 30).

Level	Building/Space
North H	B.12, B.51, B.129
North G	B.1, B.77, B.108, B.112, B.113, B.114, Sp.488, Sp.489, Sp.490
North G?	B.3, B.102, B.128, Sp.85
North F	B.5, B.116, B.119, B.131, Sp.489, Sp.602, Sp.610
North F?	B.49, B.52, Sp.99
North E	B.132
North E?	Sp.146, Sp.147

Table 1. List of North Area buildings and spaces with their currently assigned levels.

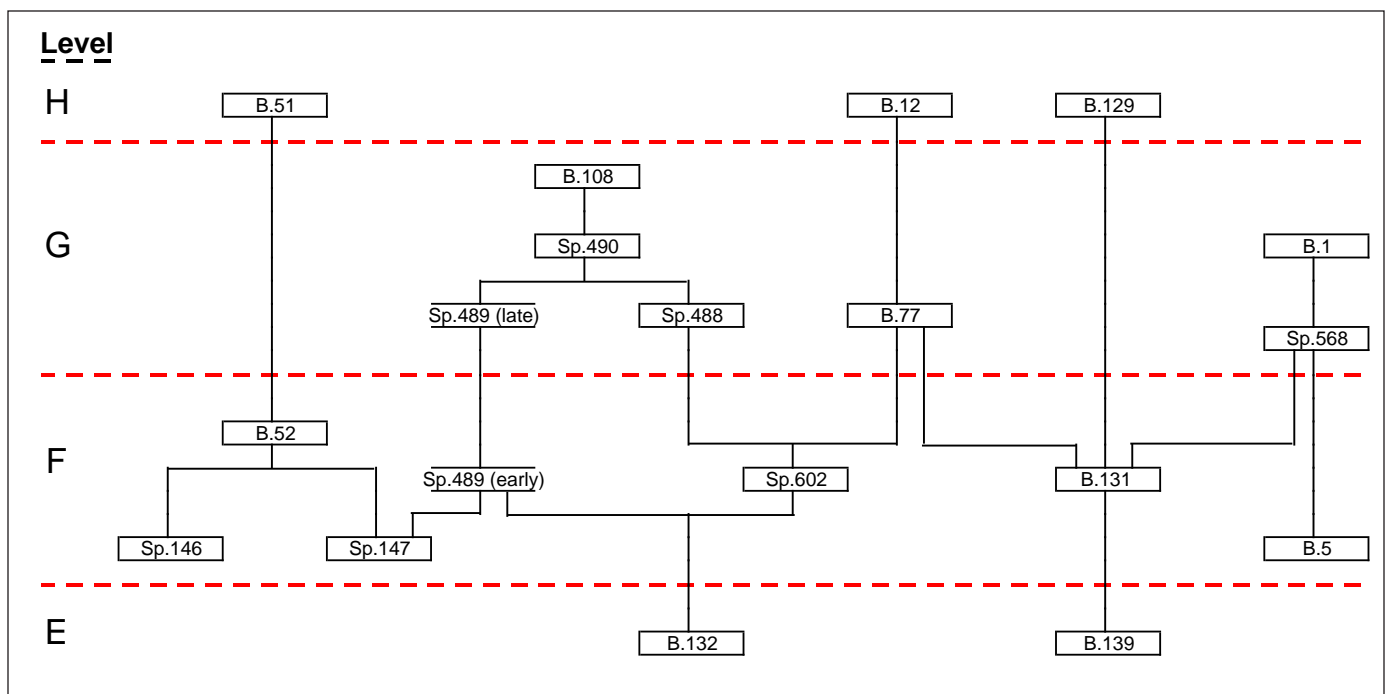


Figure 30. Harris matrix showing relationships between buildings and spaces in the North Area.

Spaces 490 and 489 are contemporary with B.77 (North F). Although B.108 should be a level higher, its construction is also assigned to Level North F, since there is circumstantial evidence that B.108 was standing during the conflagration of B.77, based on burning observable on the southern face of its northern wall.

Building 129 was built directly above B.131. However, there is no evidence that B.129 was affected by the fire in B.77 (in contrast, we see the evidence of the burning of B.77 in the outer face of the walls of other neighboring buildings to B.77 (such as B.108 and B.114). Therefore, B.129 was built after the conflagration of B.77. What is interesting is that there must have been some sort of restriction in place for not using B.131 as a refuse area - since no midden-like deposits have been found. However, B.131's burnt rubble infill was highly churned. Could this be due to the long-term exposure of these deposits to elements and further trampling rather than instantaneous processing? In summary, B.129, was built after a hiatus and has been assigned to Level North H. The nature of the rubble of B.131 also supports this stratigraphic link.

In terms of construction material, B.52 seems to be most similar to B.131, therefore it has speculatively been assigned to the same level (North F). Further exploration is needed to actually confirm this empirically.

Building 114 can also be phased to Level North G through circumstantial evidence of the burning of the outer face of its western wall through the fire that took place in B.77. Building 113 was built shortly after B.114 and can also be assigned to Level North G. It may very well be that this shortly lived building (very little occupational sequence) was destroyed due to the fire in B.77. However this is also speculative and open to discussion. The placement of these buildings will be better clarified once excavations in activity area Sp.610 resume.

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Chapter 3

Excavations in the South Area

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Introduction

Excavations in the South Area, during the 2016 field season have focussed upon a series of buildings and spaces, all of which continue excavation work begun in previous seasons (Fig. 1). These include Buildings 17, 80, 118, 160, 161 and Spaces 565 and 581 (Mellaart's Houses 31 and 32 respectively). In all cases the research questions driving the excavations were focussed upon understanding the occupation sequences of these buildings. However, since this was meant to be the last season of excavation all the areas targeted in the South Area (with the exception of Building 80), were done so with a view to preparing the ground and reducing the overburden above a deep sounding, centred upon Building 17 and Building 160, to be excavated towards the end of the season. Unfortunately this goal was not realised this year due to the premature closure of the site.

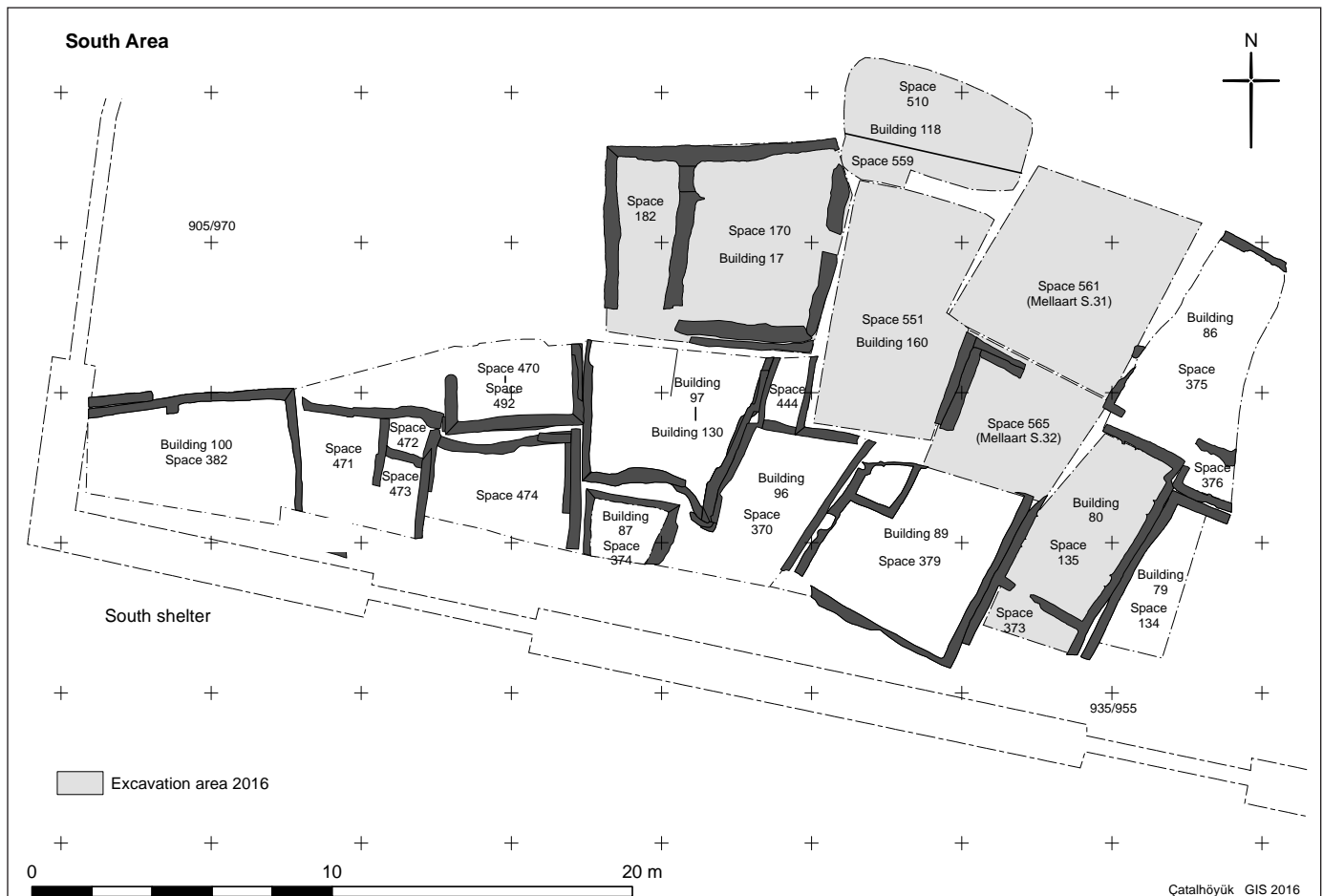


Figure 1. Map of South Area with main buildings excavated in the 2016 season (produced by Camilla Mazzucato).

Building 17 (Spaces 182 and 589)

Introduction

In 2016 work continued in B.17, Sp.170, from the point at which it was left in the previous 2015 field season, in order to prepare the structure for the removal of its architecture prior to the excavation of a deep sounding through the stratigraphy below the building towards the latter end of the 2016 long excavation season. The 2015 field season revealed four burials that were excavated and at least seven other potential burial cuts. The excavations in B.17 this year were characterised by the removal of this considerable number of burials (more than was initially anticipated at the outset of the season).



Figure 2. Overview of B.17 at end of 2016 excavations; view facing south (photograph by Jason Quinlan).

Earliest sequence

The earliest fully excavated burial this season was F.8027, a double burial (adult Sk (21856); and juvenile Sk (21858)). These were situated in a fairly small sub-ovoid cut (21857) in the northern part of the building, oriented broadly north-south (c.0.7m long by c.0.58m wide and c.0.38m deep). Typically the cut was straight-sided with a flat base, and was filled with yellowish brown silty-clay with a white plaster cap (21852), all of which were truncated on its eastern side by a later burial (F.4646), which had previously been excavated in the 1990s B.17 intervention.

The white plaster cap of this burial appears to relate to one of the earlier floors of this building. These were excavated as a large grouped compound layer (of floor/makeup sequence, (21827); allocated unit (5365) in the 1990s). In the words of excavator Erica Camurri (see excavation database):

“Unit (21827) refers to all the features (except from the walls) and floor that belong to Building 17 [...] excavated as one during this year campaign. Due to the long exposition and erosion they have been subjected to since 1999 excavation, their conservation was quite compromised at the beginning of this year[s] campaign. After a deep cleaning, that was meant to determine their approximate configuration/extension and the stratigraphic relation between the floor and the burials that were cutting it, the decision was to excavate them as one unit ([with]one exception [being] made for oven F.579).” This also included *“part of the underlying makeup layers related to the floor construction”* especially in the northern side of Sp.170.

Due to the compactness and poor condition of this units various layers, and their removal as a compound unit it has not been possible to establish a direct stratigraphic relation between the many of the overlying cut features (especially burial cuts) and the exactly corresponding floor layer.

Three small clusters were associated with this sequence of floors: two white stones (21828), situated against the eastern wall in the southern half of Sp.170; a second stone cluster (21829), situated in the lowest part of the eastern wall to the immediate south; a third cluster (21833) of bone, stone, obsidian, shell and clay ball fragments was found at around this stratigraphic level was situated to the west of post-retrieval pit F.5013[?] (possibly F.5015). All of these clusters may continue below the unexcavated floor sequence material and as such are not necessarily considered closed units at the premature end of the 2016 excavation season.

Later occupation

The majority of material excavated this season, was interpreted as being above (i.e. either sealing or cutting) the compound floor sequence 21827 (see above). The vast majority of these were cut features. A small niche was identified in the eastern wall 0.62m long and 0.26m wide, by 0.28m deep. The niche was situated about a third of the way up the wall in the southern half of the room, and its function was unclear. It was filled with a light grey-brown clay-silt (21842), and was obviously plastered with a number of 2mm plaster layers inside. A few small ochre fragments were identified in the fill.

Southwestern hearth and associated structures

In the south-westernmost corner of the space a circular structured hearth with raised sides was located (max. diameter 0.59m). The installation was associated with an orange brown clay floor (21860), itself containing clay balls and stone. The fill of the hearth itself (21859) was grey brown clay silt, which also contained a cluster of stones and clay balls and charcoal.

Sealing this hearth (or perhaps associated with), were three shallow basin [?] structures, or low plaster platforms and makeup material, F.574, F.585 and F.586 (approximately 0.50m across, but all very badly eroded). The exact relationship remains ambiguous as the structures were completely excavated at the end of the 2016 season.

Possibly associated with this group of structures and sitting on the floor sequence below (21827), were a series of three discrete clusters of stone (21845) and animal bones ((21830), (21840)). These were overlain by bright orange clay makeup material, related to the construction of a later platform, F.558, (in fact this make was grouped in with and removed as the generic floor sequence unit – (21827), due to poor preservation and distinction from other units in the occupation sequence). This platform was probably around 1.40m east-west by 1.10m north-south, it remains unclear what height it would have survived to.

Pitting

A small sub-ovoid pit, F.8030, was situated in the southwest corner 0.40m east-west by 0.58m north-south). The cut (21864) had vertical sides and a flat base and yielded two obsidian blades before being filled in by a greyish brown silty sand fill (21862), which became more clay rich towards the base.

Elsewhere in the northwest corner of the space another small pit was identified and excavated, F.8023. The cut of this pit, (21824), was not clear in plan prior to excavation, due to cracks and erosion in the floors through which it cut (or was perhaps sealed by – some of these relationships remain ambiguous due to the preservation of the floors themselves; again see discussion above). Cut from a height of 1003.14mASL, the mid grey ash-rich silt fill (21835), was almost sterile except for the presence of four animal bones.

In the in the centre of the southern half of Sp.70 a sub-ovoid pit feature, F.8026, was cut, between 0.30-0.35m diameter and only 0.17m deep. The cut (21847) was filled with a grey-brown sandy silt (21844) with stone and bone inclusions. The function of this pit remains unclear, although the excavators felt from the irregular morphology in the base that it may have been used to house a cache.

To the northwest of this pit was another squarish pit, with rounded corners between 0.35-0.42m wide, F.8029. The cut for this pit (21891) was only 0.11m deep with a fairly even and flat sides, but the fill ((21850) – a dark grey silty clay) was characterised by a high concentration of burned stones and clay balls, suggesting the pit may have been related to pyrotechnic activities in the southern part of the space.

Situated in the south-central area of the space was another pit feature, F.8016. Initially thought to be a burial, this cut (21813), turned out to be empty and possibly served as a posthole. The two fills (lower – (21816)) and (upper – (21812)) were mid grey clay silts with finely bedded ashy lenses, and were hard to distinguish from the midden like material which appeared to underlie the structure (yet to be excavated).

Also in the southern and eastern quadrant of the space was a small pit, F.8031, which may have served as a small pyrotechnic installation (hearth). The sub-rounded concave cut (21881), was up to 0.46m in diameter, and 0.14m deep and was filled with a light reddish brown (interpreted as burnt?) sandy clay-silt (21868) with occasional charcoal inclusions.

Adjacent to this (to the west) was a second small sub-rounded concave pit F.8032, also thought to be a hearth. The cut for this unit (21882) was also about 0.45m in diameter and 0.18m deep; its fill (21869) was a pinkish brown sandy clay silt.

Northern side of space

Abutting the north wall of the space (associated with a higher phase of activity perhaps) was an orange clay-rich makeup layer (21838) that was shaped to form the construction base and partition for two overlying basin features: F.577 to the west, and F.578 to the east. These basins were first exposed during the 1999 excavation of the space, and remain unexcavated at the end of the 2016 season. The western basin F.577 appeared to seal the rooms main floor sequence, and was approximately 0.50m across, surviving to a height of around 0.10m. It was filled with a mid brown-grey clay-silt ((21837)=(5367)), which contained frequent charcoal and plaster flecks. To the east, F578 was slightly wider, at 0.60m across, but was essentially filled with a very similar material ((21839)=(5368)), but with less charcoal. None of the fills yielded any finds.

Oven structures

The formal ovens in were all situated in the north of Sp.170. One of these (F.580, as yet unexcavated) remains a little ambiguous, described by the excavator (C.R.N.), as potentially being part of an oven complex, or 'double oven', some 1m long by 0.50m wide. However the main oven sequence in the space

Oven F.579, situated in the northeast corner of the space (Fig. 3), was partially excavated during the 2016 excavation season, and a construction and use sequence could be determined, even if the full sequence was not completed. The oven appeared to sit upon the broad grouping of occupation floors and makeup ((21827) – discussed above). The oven is described (along with F.580 discussed above) as potentially being “*part of a double oven complex [...] contained in the most northern part of the room by a partition/ridge*” –E.C.



Figure 3. Northeast facing image of oven F.579 (photograph by Jason Quinlan).

The earliest identified unit in this oven sequence, was a floor, or baked oven base (21867), which remains *in situ* at the end of 2016. The surface of this basal deposit, situated at a height of 1003.22mASL, showed clear signs of burning (manifesting as variable discolouration). Cut into this surface was an 0.80m diameter circular cut (21870) with an even concave base (c.0.17m) deep. The cut was filled with a distinctive fill (21866), comprising of two discrete components: a lower dark grey-brown clay, supporting large fragments of stone and clay ball; this grades into a lighter yellow-orange (heat-affected), more silt-clay deposit supporting the same stone and clay ball material but in smaller fragments. The boundary between these two fill (if there was one) was indistinct, suggesting the material was laid in this way purposefully, perhaps as part of the oven construction.



Figure 4. West-facing photograph of uppermost oven floor (21851) showing associated bone and stone cluster (photograph by Jason Quinlan).

This cut was sealed by a sequence of two more baked floors or oven bases: (21865) and (21851) respectively (Fig. 4). Both of these units appeared to be compound layers, which included both the smoothed surface of that phases oven floor and its corresponding makeup material. The makeup in these instances were *c.*20mm thick clay silt with charcoal inclusions, and the surface itself a further 10mm deep – however the distinction may be due to heat penetration. The oven was finally sealed by a thick layer (*c.*0.08m) of debris (21849), which probably represented the collapsed superstructure of the oven. The material was an aggregate of silty clay of different coloured silt-clay (white, yellow, orange, brown), with occasional charcoal and plaster flecking, along with clay balls and stones.

Burials

In total, six burials were identified and excavated this season in Building 17. These were distinct from those excavated in previous seasons, because they appeared to be sealed by a common floor surface ((5363) – see below) throughout the room. These burials (F.8015 – adult female, F.8017 – sub-adult, F.8018, F.8019 - adult, F.8204 and F.8214 – child - respectively), were all, for the most part, clustered in the western half of the structure (the easternmost being F.8015/8212, which was situated just to the north of centre). Most of these cuts (again excluding F.8015/8212) formed an intercutting sequence of similarly sized burial pits, all sub-rounded pits up to 0.87m in diameter and 0.52m deep (see Fig. 2). The fills of all these burials were firm and compact silt-clays ranging from light brown to more orange brown in colour. The fill of F.8019 (21821), yielded six clay balls; similarly the fill of F.8214 (21853) contained traces of ochre and the fill of F.8017 (81814) appeared to show phytolith evi-

dence that the skeleton was wrapped in a woven blanket. F.8204 was notable because it appeared to have a secondary (empty cut) high up in the fill ((22529), filled by (22511)) of unclear function.

Latest activity

These burials were finally sealed by a floor surface (5365), which effectively covered the whole space, apart from the southwestern platform and associated southern dirty floors. The floor was a sterile mid-greyish brown silt-clay with very occasional charcoal flecks at a height of 1002.94m ASL. A single post-retrieval pit that cut this floor was excavated this season (F.8022), situated to the south of the centre against the eastern wall of the space. The pit was relatively small, being a semi-circular cove, with a flat base and more concave sides to its south side (c.0.56m diameter and 0.30m thick). The fill of this cut was a compact brown silt clay with occasional charcoal and plaster flecks.

The latest deposit to be removed this season was some residual room fill (21818), which was situated the east wall of the space, filling a slight overhang of the wall (c.0.40m long by 0.26m wide). The number is the same as 22507 excavated in 2015.

Buildings 160, 161, 43, 89 and Spaces 553 and 581

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Introduction

The following is a summary of excavations undertaken in the South Area during the 2016 season. The main goal of the season was to work effectively and reach early levels as soon as possible in order to learn more about spatial and social organization of the settlement at its dawn. Also, an important part of the fieldwork was to collect charcoal and bone samples that could be suitable for radiocarbon programme. Sadly enough, it turned out to be impossible to achieve all these goals due to worrying levels of insecurity in Turkey and eventual closure of the site. Nonetheless, sequences of buildings: B.160 – B.161 – B.43 (Sp.600) – B.89 (Sp.565) as well as Sp.553 – Sp.581 were excavated (Fig. 5). These sequences provided archaeologically and architecturally relevant information, including a few unexpected new findings.

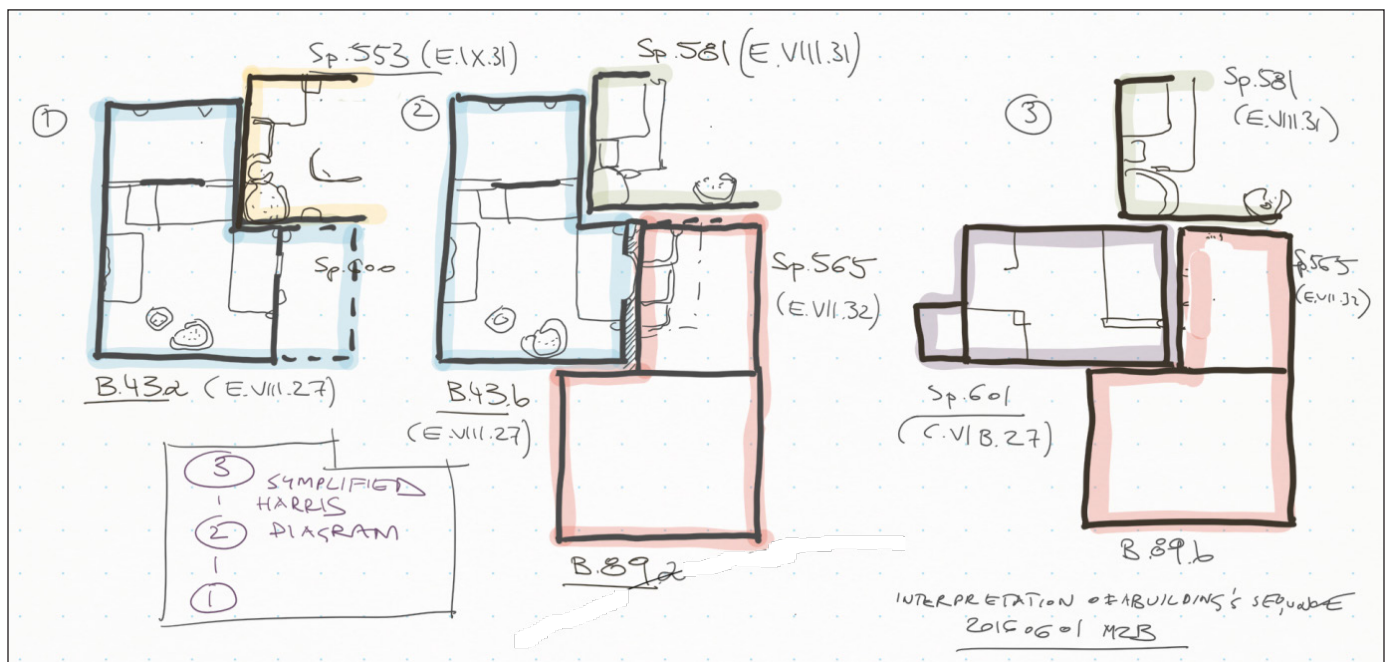


Figure 5. Sketch illustrating architectural and stratigraphic relationships between B.43, B.89, Sp.553 and Sp.581 (produced by Marek Z. Barański).

Starting from the bottom up, remnants of building B.161 were partly revealed and only few of its features were excavated. This house consisted of a southern main room (Sp.605) and a northern annex (Sp.606). B.160 was a next building in sequence. It seemed to follow the outline of the preceding built structure. Features within a main room (Sp.551) of this house were only partly identified and documented as the most eastern and southern parts of the space were left behind the excavation limit. Northern annex (Sp.552) of B.160, in contrast to the main room, was unearthened and dug in its entirety. Building 160 was directly followed by B.43 which was largely excavated in previous excavation seasons. In 2016 only some remnants of eastern annex (Sp.600) of this built structure were revealed and excavated. This space was abandoned and backfilled during a life span of house B.43. And in time, it was truncated and replaced by a northern annex (Sp.565) of B.89.

The excavation included also some remnants of buildings situated to north-east of the mentioned sequence. In a sense, these built structures constitute an independent column of buildings due to limited extent of field work in this area as well as 1960's excavations. All in all, most eastern part of a main room (Sp.553) was re-exposed and only a couple of its architectural features were excavated. This space is most probably same as building E.IX.31 excavated by James Mellaart which was followed by "red shrine" E.VIII.31. Some remnants of walls of the latter were excavated, both in 2015 and 2016 seasons.

Building 161: Spaces 605 and 606

Building 161 seems to have L-shaped plan and consist of two spaces: a regular southern main room (Sp.605) and an intriguing northern annex (Sp.606) which is defined by a curved partition wall and a large oven (Fig. 6). The most southern and eastern part of the main room is situated behind the limit of excavation.

Looking at sections exposed in post-retrieval pits, multiple sequences of floors and platforms can be distinguished. These features were arbitrary grouped into three main rebuilding phases, of which only the final one was excavated.

The mid-phase, with regard to the main room, could be described by a white (lime) plastered floor area that appeared to be sunken in relation to northern platform of a size about 2.0x0.5x0.04m. Also, there are most probably at least four burials situated in the central part of this space. These burials were cutting one into other and the top part of the infill of these features was excavated as one arbitrary unit (32630). Up until that point no articulated human remains were found. As far as the annex is concerned, some patchy layers of floors were revealed with no clear traces of any internal architectural features.

The last rebuilding phase is demarcated by a large oven (F.8160) about 1.0x1.0m in plan. This fire installation was situated in the north-east corner of the building, most probably within the northern annex Space 606. It was preserved up to about 0.5m and had a very interesting construction which consisted of a well-defined base and a classic domed superstructure that was abutted from the north, east and south by set of mudbricks. These blocks separated the fire installation from the surrounding external walls. Their shape, color and texture were very similar to the building material used to construct a curved partition wall. Some special deposits, including shells and animal bones were found on the oven base (32631) as well as between the oven and surrounding walls (32632). It is not sure whether some artefacts are situated also underneath this fire installation as the excavation of the makeup layer was stopped at arbitrary level. It is clear though, that the oven was built on top of yet another fire installation, most probably a hearth (F.8161), which could have

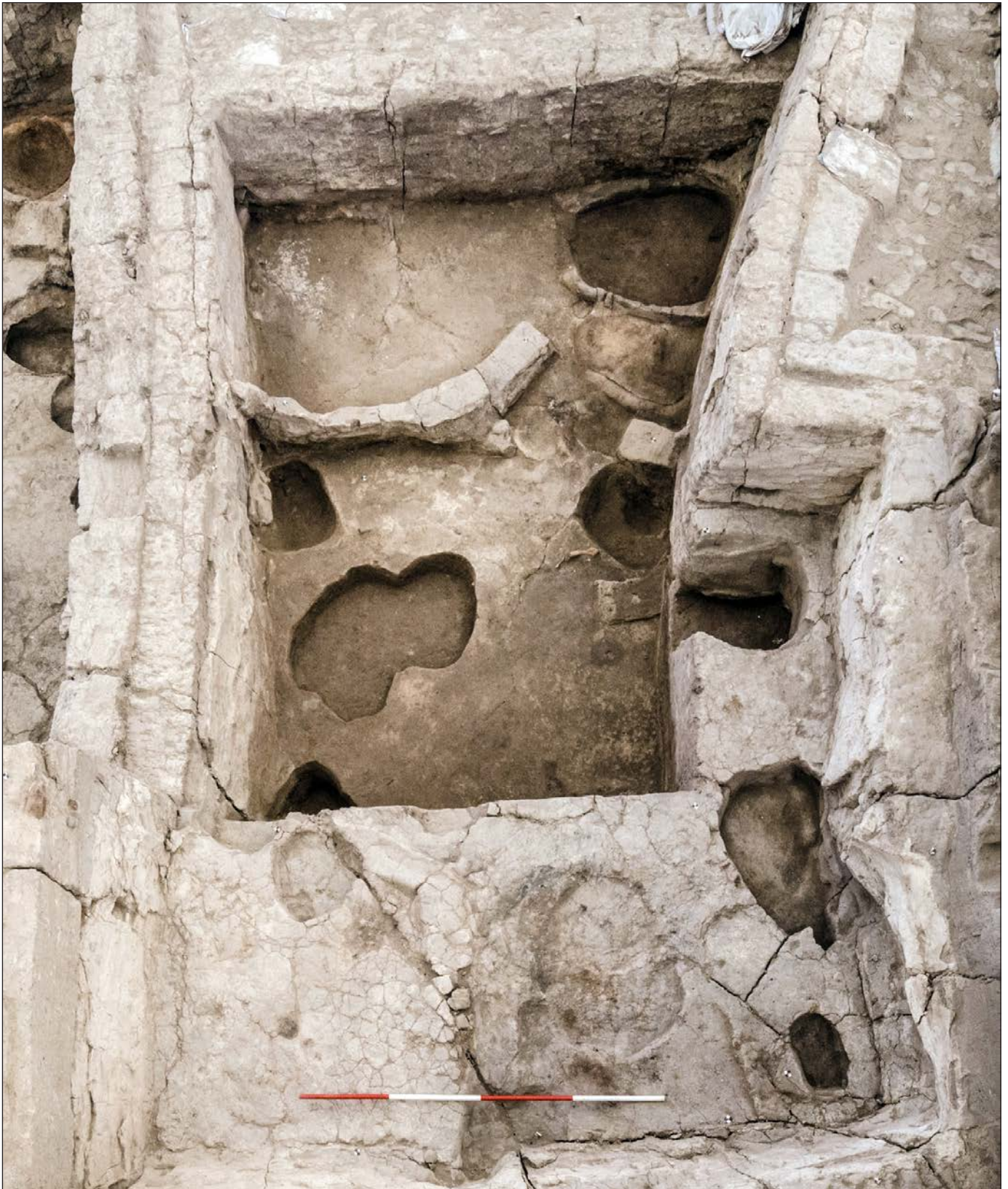


Figure 6. North-facing overview of B.161 showing unexcavated southern and eastern sections at end of excavation 2016 (photograph by Jason Quinlan).

been associated with a previous phase of building use. As far as the main room is concerned, a sequence of floors and a discrete fragment of a northeastern platform with a rather short bench were documented (32626).

The abandonment phase of B.161 is demarcated by a few impressions of small baskets situated directly on the floor surface as well as three post-retrieval pits that were registered in the northwest (F.8165), northeast (F.8167) and most probably southwest corners (F.8166) of the excavated space. The floors, platforms and fire installation were sealed by roof collapse (32616), including fragments of red-painted ceiling (?) plasters, roof/ceiling occupational surfaces as well as timber and matting impressions. The interior was then filled with various deposits that were clearly sloping to the north. Interestingly, on top of these layers a human skeleton (burial F.7849) was found that seemed to be thrown into the abandoned building (no grave cut was documented) and covered with soil and architectural debris (32611). The skeleton Sk (32606) belonged to a young man (Fig. 7). His body seems to have been constricted and perhaps wrapped up in matting as evidenced by a large number of accompanying microfaunal remains.



Figure 7. West-facing (top-down) overview of complete B.161 during its abandonment, showing position of human skeleton (photograph by Jason Quinlan).

Building 160: Spaces 551 and 552

Building 160 seems to respect the outline of preceding Building 161. It had an L-shaped plan and a southern main room Sp.551 and northern annex Sp.552 (Fig. 8). However, it is possible that this building was much bigger or other spaces were added to it at some point of time as an external plastered ambiguous feature (32606) as well as remnants of patchy wall plaster were documented on western phase of western wall F.7842 and northern phase of northern wall F.7841 of B.160. This hypothesis may be also supported by the fact that crawlhole F.7845 with a shelf leading from the main room to the annex was turned into a niche (F.7846) at some point of time. Interestingly, the annex was still in use after this blocking event. This is confirmed by replasterings of wall and floor surfaces as well as existing of some kind of a low wall post (32614).



Figure 8. West-facing overview of B.160 at end of 2016 excavations (photograph by Jason Quinlan).

The simple walls of B.160 (main room: F.7824 west wall, F.7825 north wall, F.7826 east wall, F.7827 south wall; annex: F.7825 south wall, F.7841/F.7847/F.7835: north wall, F.7842: west wall, F.7843: east wall) were preserved up to about 0.7m. These architectural features were made up of characteristic

grayish mudbricks and whitish mortar which were covered by multiple layers of white (lime) wall plaster (with a recess at the bottom) within the main room and some patchy layers of grayish wall plaster within the annex. Interestingly, the plaster on south wall F.7827, just above platform F.7834, bore traces of unspecified geometrical paintings painted in red and eventually covered with another layer of plaster. It is also likely that western wall F.7824 was decorated with some kind of wall feature as the plastered surface is strangely uneven and saggy in many places.

The northern wall (F.7841) of the annex was largely rebuilt on three occasions, perhaps due to unsafe inclination or damage of the original structure (Fig. 9). Firstly, the grayish and white wall F.7841 was strengthened with mudbrick structure F.7847 using the same building material. It is possible that this work was undertaken at an early stage of building life-cycle, perhaps even during a primary construction of the building. Many artefacts (see detailed priority discussion for (32494), (32495), (32496) and (32600)), mostly clay balls and stone objects/tools, were found directly underneath this new mudbrick wall (F.7847) and could be interpreted as commemorative or foundation deposits.

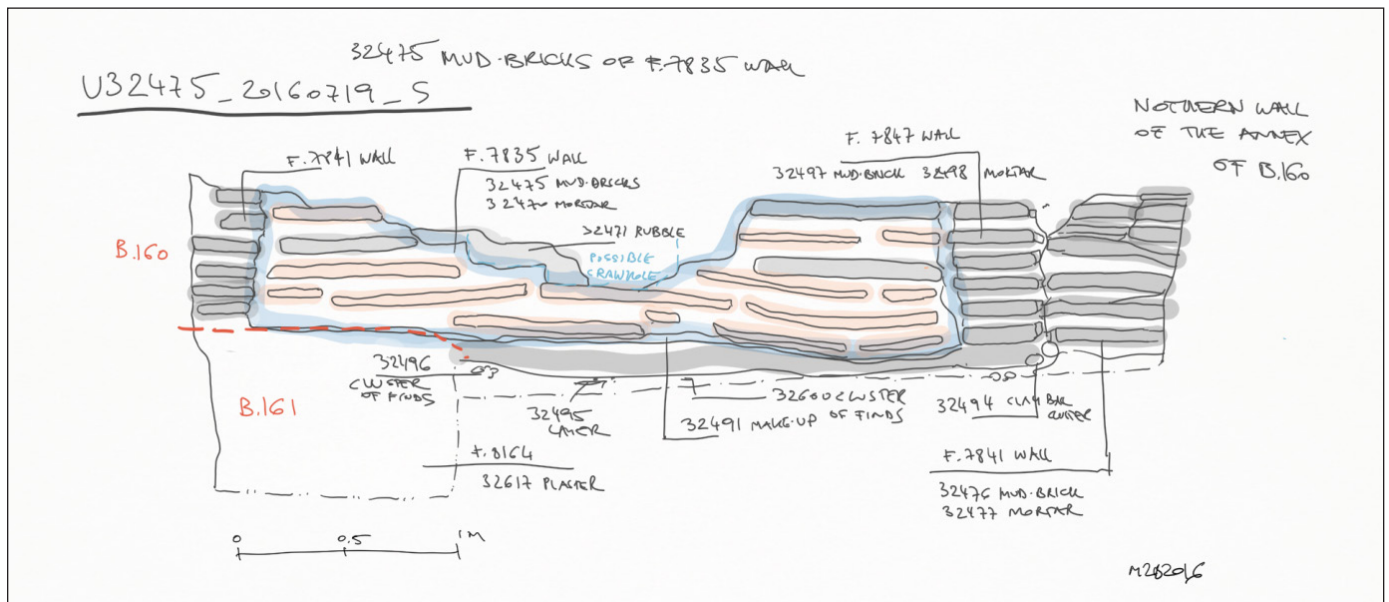


Figure 9. A sketch illustrating rebuilding of northern wall of B.160 (produced by Marek Z. Barański).

Surprisingly, one of these clusters (32496) included an articulated skeleton of a few-month old wild cat (most probably *felis chaus* or *felis silvestris*). There were also some remnants of a wooden plank that could have been a part of a threshold preceding a crawlhole to an unspecified space to the north of the annex of B.160. At some later stage walls F.7841 and F.7847 were largely truncated and replaced with a new structure F.7835 made up of mostly orangish mudbricks and hard whitish mortar. The latter was also used as a wall plaster and was considerably thicker than the mudricks which seemed to be laid wet. It is possible that there was a crawlhole in a central part of this wall which in that case lead to another, yet unknown, internal space.

As with building B.161, three main rebuilding phases can be distinguished. These phases represent a simplified view on buildings life history as some multiple, minor and partial floor replasterings were arbitrary grouped due to general poor preservation of these surfaces. Anyway, some of these floors seem to cover only part of the interior and could be interpreted as repairs aimed at

making the surface even again. The grouped floor sequences were excavated together with relevant makeups.

So, the early phase is defined by the main room and the annex that are connected through a crawlhole with a shelf (F.7845) and an ambiguous and small wall opening (F.7844) situated about 0.8m above floor level. A central floor area ((32462), (32492), (32464)) was limited from the south by platform (F.7834) and fire installations, including hearth F.8161 and perhaps oven F.7838. Unfortunately, these architectural features were only partly exposed and left behind the limit of further excavation (Fig. 10).



Figure 10. South-facing photograph of complete oven (F.7838) and hearth (F.8161) (photograph by Jason Quinlan).

In the northeast corner of the main room another poorly preserved, domed fire installation (F.7815) was found that was cut into a wall (F.7825). It was fully excavated, including a cluster of numerous artefacts (32467) situated underneath the primary base ((32407), (32457)) of this feature. The cluster consisted mostly of fragments of clay balls and lumps of backed clay as well as few worked stones, animal bones and obsidian flakes. Last but not least, there was a burial (F.7848) situated in the central part of the main room which included a skeleton of young female laying on its right side with the head facing west. However, the burial and north-east oven F.7815 might have been as well associated with the next phase of building use.

The mid-phase is clearly demarcated by sequence of clean (32455) and dirty floors ((32440), (32441), (32456)), rebuilding of south-western platform F.7834 (with related, however poorly preserved wall paintings and possible unexcavated burial underneath) as well as south-eastern hearth F.7837 and further use of northeastern (F.7815: two or three rebuilding episodes) and perhaps southeastern oven F.7838. At this time, the main room

and the annex seems to have been no longer connected as crawlhole F.7845 was transformed into a plastered niche (F.7846) situated on the side of the main room.

The latest phase of building includes another sequence of clean (32404) and dirty (32453) floors and related makeups. These patchy surfaces appear to be sunken in relation to rebuild southwestern platform F.7834 and newly built northeast platform F.7820 (with related adult burial F.7821 laying on its left side with head facing east) as well as south-eastern fire installations, including contemporary large oven F.7816 and hearth F.7817. The northeastern oven seems to be transformed into a plastered niche (F.7815) with some kind of a shelf or platform (Fig. 11). Also, burials F.7828 and F.8163, of a child and an infant (in a basket) respectively, might have been associated with this

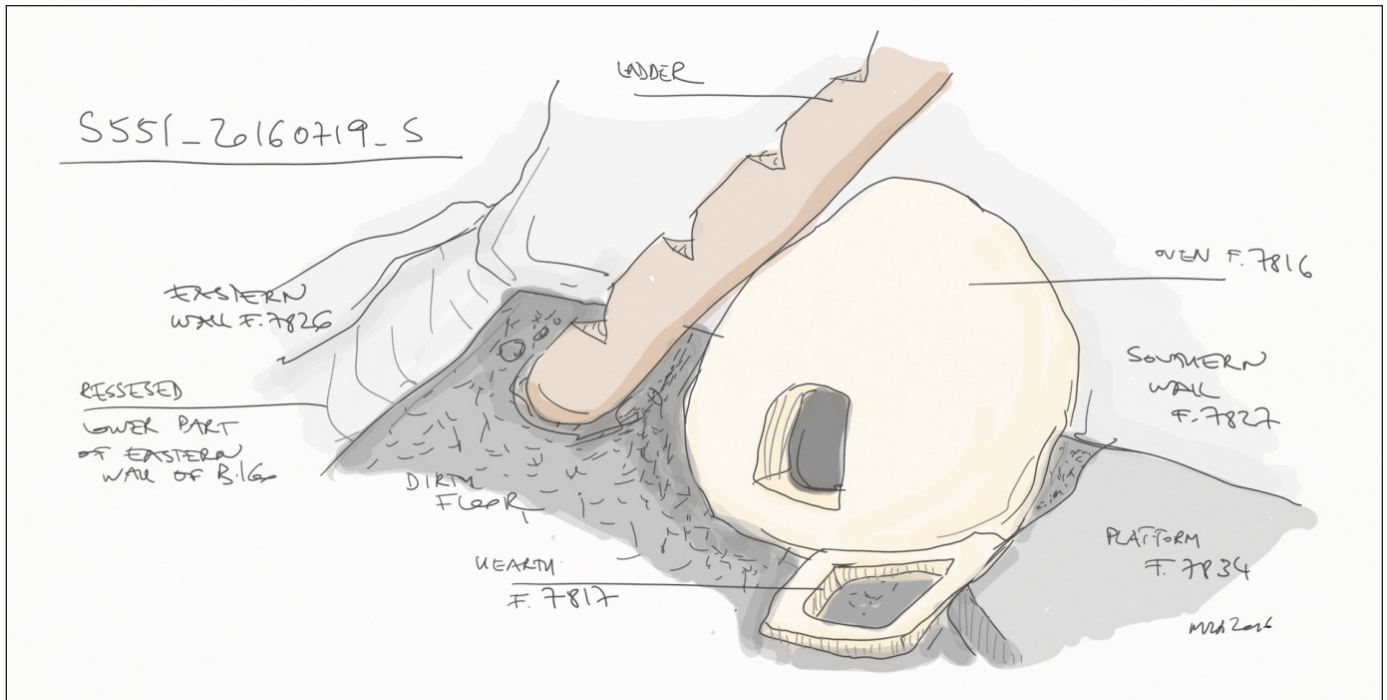


Figure 11. A simple reconstruction of southern part of B.160 in its latest phase of use (produced by Marek Z. Barański).

phase. These burials were situated in east-central part of the main room (the child burial truncated the burial of an adult F.7848).

It is not clear how the annex was used with regard to the phases of use of the main room. Surely, a reference point is the crawlhole F.7845 and the later niche F.7846. However, the floors ((32469), (22337) and (32491)) within the annex are very patchy and poorly preserved. These floors were distinguished on the basis of various artefacts scattered on arbitrary surfaces rather than actual layers of plaster.

Abandonment phase of building B.160 (or actually its main room) is demarcated by four post-retrieval pits (F.7829, F.7819, F.7813 and F.7818) situated alongside eastern and western walls (the original posts doesn't seem to have been abutting the wall faces). One of these pits (F.7829) truncated north-south oven F.7815. Also, a small pit (F.7839) to the east of large oven F.7816 was documented. This must have been a place where ladder was placed. A cluster rich in artefacts were associated with this feature. Even more interestingly, a few considerably smaller and shallower pits (F.7831, F.7833, F.7832 and F.7840) were documented in the central part of the main room (Fig. 12). These features included various artefacts, mainly large and broken aurochs bones, clay balls and some microfaunal remains (see detailed priority discussion for units (32430), (32413), (32431), (32429) and (32444)). Lab comparisons of faunal material indicate that these short lived features are contemporary and might be considered as a part of an abandonment deposits that were eventually sealed with room infill ((22324), (22301), (22300)).



Figure 12. Southeast-facing view of B.160, showing various features including cluster-filled pits (F.7831, F.7833, F.7832 and F.7840) (photograph by Jason Quinlan).

Building 43: Space 600

Building 43 was believed to respect the plan of preceding houses B.161 and B.160. This observation seemed to be confirmed by the layout of southern main room (Sp.235) and northern annex (Sp.236) that were excavated in 2014 and 2015. The simple walls which defined these two spaces were situated directly on top of earlier mudbrick structures. However, 2016 season brought some new insights on construction and primary layout of B.43. Remnants of another annex (Sp.600) to the east of the main room were exposed in section and partly excavated (Fig. 13). This space is defined by heavily truncated northern wall F.7822, mineralized posts (F.7809 and F.7810) as well as crawlhole F.3575.

The two posts (F.7809 and F.7810) were built against eastern face of eastern wall F.1855 of B.43 – one in the north-western corner of the annex and another one more or less in the middle of the length of the wall. These features were clearly not removed as some mineralized wood fragments ((21804) and (22373)) were still preserved *in situ* to the height of about 1.5m and covered with fine layer of plaster. Consequently, primary and about 0.3m deep post holes were also preserved. These features truncated midden deposits (22372) as well as underlying eastern wall F.7843 of building B.160. There were also traces of a large crawlhole with a shelf (F.3575) documented with some animal bones (possible foundation deposit within makeup that was left unexcavated) directly underneath the crawlhole's plastered base. This feature originally allowed a passage between the main room and the eastern annex of B.43 and was transformed with time into a series of increasingly smaller niches (F.1851-F.3574-F.1865) (Fig. 14). All these features were largely excavated within different excavation season which made it challenging to reconstruct their exact form and function

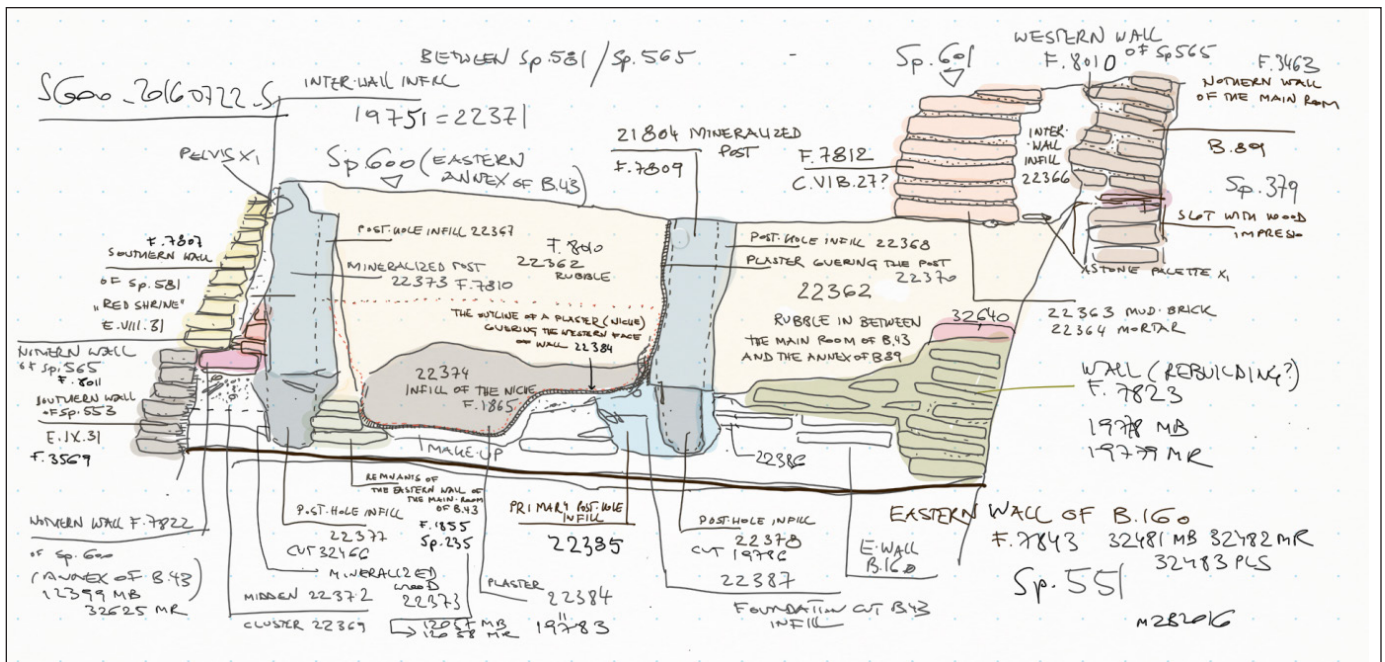


Figure 13. A sketch of eastern section with remnants of Sp.600 (produced by Marek Z. Barański).

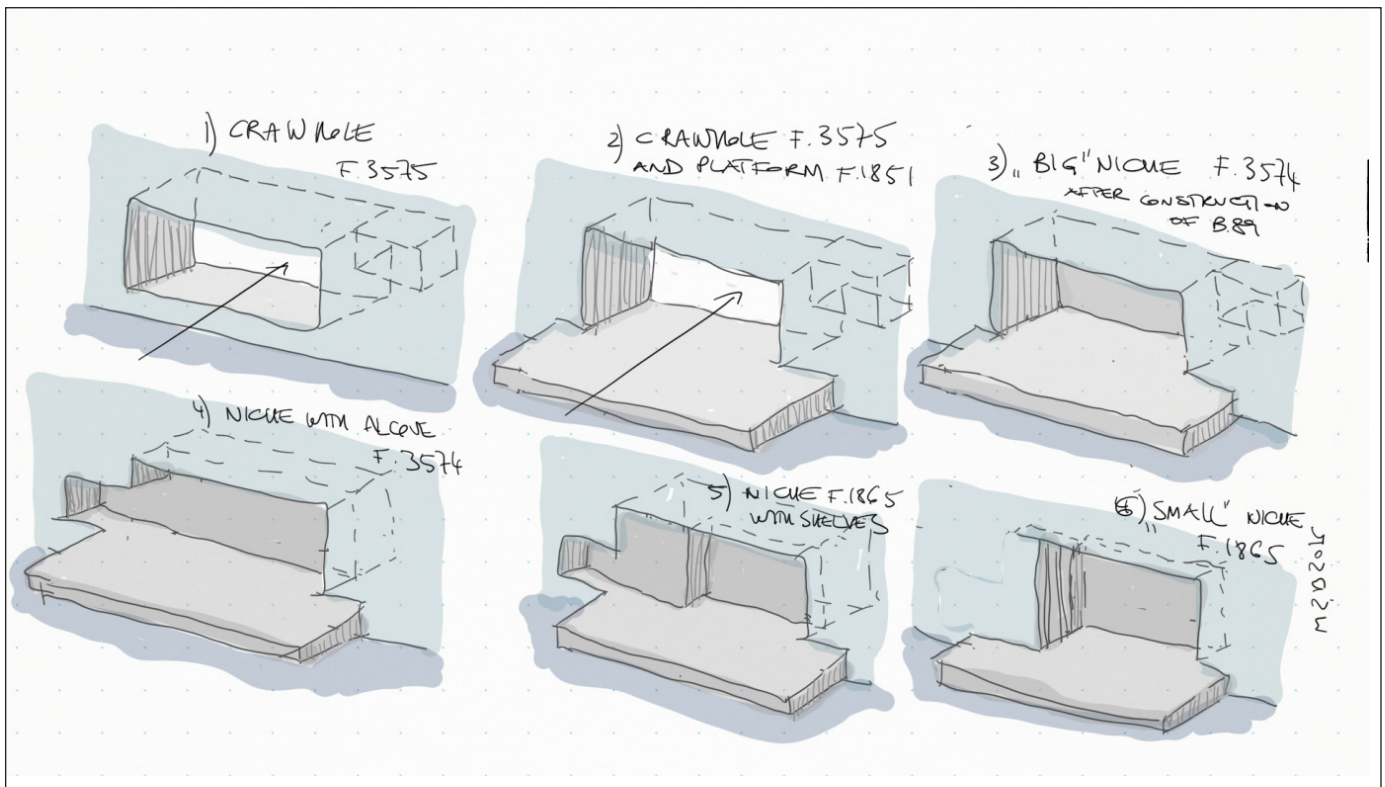


Figure 14. A reconstruction of the transformation of crawlhole F.3575 into a series of niches (F.1851-F.3574-F.1865) within B.43 (produced by Marek Z. Barański).

as well as relation to other features. Nevertheless, the blocking of the crawlhole was clearly made when the annex (Sp.600) came out of use, perhaps as a result of construction disaster. The plaster associated with this feature also covered western face of eastern wall F.8010 of a storage room (Sp.565) of house B.89 that seems to have been built in place of the annex of B.43.

The space between the eastern wall of the main room (Sp.235) of B.43 and the western wall of the storage room (Sp.565) of B.89 (the latter only abutted the preserved posts) was filled with densely packed rubble (22362), including fragments of mudbricks, mortar and plaster.

All the walls of B.43 were dismantled in 2015. Interestingly, a cluster (19771) of partly articulated bones of a piglet sealed with a cattle scapula were found on top of the eastern wall (F.7826/F.7843) of B.160 and adjacent to western wall (F.3568) of Sp.553 at the place where eastern wall (F.1855) of B.43 was situated. The layer associated with this cluster was in previous season interpreted as inter-wall infill. However, the bones seemed rather to be situated within foundation trench F.3575 for eastern wall of B.43 and therefore could have been a part of foundation deposit. The same foundation cut is also clear further to the south with more animal bones (including a few scapulas) ((22387), (22369)) documented that could have been another sign of ritual practices associated with construction process. However, it is not why building the eastern wall of B.43 was commemorated on so many occasions.

Space 553 / E.IX.31

Space 553 is the western part of the main room of a building designated by Mellaart as E.VIII.27 (Fig. 15). It was exposed in the 1960's and has been gradually and naturally backfilled since then. As part of the 2016 season excavations, some of the features within Sp.553 were re-excavated in order to collect suitable samples for the purpose of radiocarbon dating programme. In this regard, the excavation included two fire installations (F.3570 and F.3571) situated in south-west corner of the room. Also, southern, eastern and northern walls were partially dismantled for safety reasons as well as to allow easy passage to the buildings (B.160 and B.161) within the main excavation trench. These simple walls (F.3569: south wall, F.3568: west wall and F.3567: north wall) made up of grayish mudbricks and greyish brown/brown mortar with some traces of eroded wall plaster and were preserved to a height of about 0.7m above the exposed features (the floor within Sp.553 was not defined as it must have been exposed in 1960's and eroded since then).

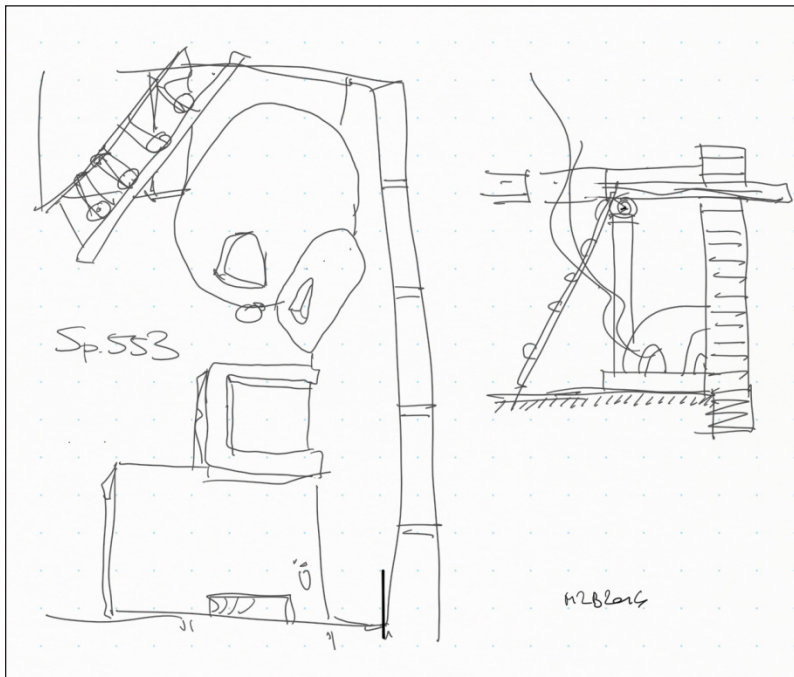


Figure 15. A simple reconstruction of the western part of Sp.553 (produced by Marek Z. Barański).

The main feature of Sp.553 was a large oven (F.3570) about 1.1x1.2m build in the south-west corner against southern wall (F.3569). It consisted of a doomed superstructure and a sequence of floors and makeups. The superstructure was only partly preserved. However, traces of its original outline were visible on the face of the wall. The oven underwent at least three rebuilding episodes. The early two floors could have been deliberately dismantled as these features were preserved to a very small extent. Also, the oven was largely truncated by animal borrows. The latest and thick base covered most of the oven's interior. It must have been exposed in 1960's as it was sealed with backfill. The entire oven seemed to be placed on an earlier unexposed floor within Sp.553.

The large oven (F.3570) was abutted from the north by another oven (F.3571) which was cut into western wall F.3568 of Sp.553. It was considerably smaller and measured about 0.5x0.7m. Also, it was in a more intact state of preservation. This feature consisted of a superstructure and a sequence of floors and makeups as well as final fill. As with the large oven, three main rebuilding episodes were distinguished on the basis of the number of preserved floors. The superstructure was made up of finely backed orangish clay and was a few times replastered. The floors were thin and made up of shinnny lime and clay. The oven interior seemed to be cleaned regularly as there were not too many charcoals found. However, a few clay balls and stones were situated on the latest oven's floor and next to oven's opening.

Both ovens seem to mark the final phase of use of Sp.553. These fire installations might have been associated with other (earlier) features that were found alongside the western (F.3568) and southern (F.3569) walls. Due to a large extend of damage/erosion it is hard to define the original form and function of these features. It seems that a platform (F.3573) with a possible bench and traces of multiple replastering was situated in north-western corner of the space. More to the south, between the platform and the small oven there could have been some kind of a basin (F.3572) rectangular in plan. However, none of these features were excavated.

Space 553 was abutting eastern wall F.1855 of B.43. However it seems that it was earlier than this building. This hypothesis can be proved by some midden layers ((22372) visible in section) that accumulated alongside southern wall of Sp.553. These deposits were later truncated when eastern wall F.1855 of the main room (Sp.235) and northern wall F.7822 of the annex (Sp.600) of B.43 were constructed. Interestingly, the external face of southern wall F.3569 of Sp.553 was covered with about 1.0cm thick distinct layer of orangish clay.

Northern wall F.3567 of the annex was also abutted by midden deposits (see Sp.583: (19773), (22230), (19776), (22322)) within which some zoomorphic clay figurines were found. These layers sealed remnants of unspecified mudbrick wall or foundation (F.3567, Sp.604) that were partly truncated during 1960's excavation and are still visible in section. It is not clear, though, which Mellaart building these features can be assigned to.

Space 581 / S.VIII.31

Space 581 is in fact only defined by remnants of walls most probably associated with Mellaart's so-called "red shrine" S.VIII.31 excavated in 1960's. The southern wall (F.7807) was preserved *in situ* to the height of eight brick courses. It was made up of orangish brown mudbricks and grayish mortar and was partially excavated in 2015. The wall was situated on a thin layer of rubble covering the top of southern wall (F.3569) of Sp.553 (E.IX.31). It also truncated the northern wall (F.7822) of eastern annex (Sp.600) of B.43. Traces of some kind of a niche (19749) sealed with possible layer of burnt plaster (maybe traces of an earlier fire installation) were found on the wall face. This feature was clearly associated with a floor which left a mark on the wall in the form of a horizontal line. The southern wall truncates the northern wall of eastern annex of building B.42.

The northern wall was preserved in a form of a wall collapse that was found within backfill (19747). This feature bore traces of multiple layers of plaster painted in red. There were also fragments of bucranium found next to these remnants. It is possible that they constituted a primary wall decoration. Western wall F.7806 was excavated in 2015.

Building 89: Space 565

Space 565 constitutes a northern annex of building B.89 as confirmed by a clear brick bond between northern wall F.3463 of the main room (Sp.379) and western wall (F.8010) of the annex. Only most western part of this space was excavated within a sondage trench about 2m long and 1m wide. This has proven enough to reveal remnants of bin installations (F.7808) alongside plastered northern wall (F.8011) that were eventually sealed with thick room-fill deposits ((22356), (22353), (31614) and (31603)) including various collapse material. At the top of this sequence a child burial (F.8008) was situated. This feature is related with the later phase of the annex demarcated by features excavated in 2015. Space 565 was built in the place of eastern annex (Sp.600) of B.43. It seems to be more or less contemporary with Sp.581 which is situated directly to the north.

Space 601 / C.VIB.27

Space 601 most probably constitutes remnants of Mellaart's building C.VIB.27, excavated in 1960's. It is in fact few brick courses (F.7812) that made up south-eastern corner of the house. This feature was built on top of rubble (22362) which was situated between B.43 and B.89. It also abutted western wall F.8010 of Sp.564 and northern wall F.3463 of Sp.379 in B.89. Underneath and close to the base of wall F.7812 some artefacts were found, including stone palette. Also, a large piece of a stone tool seemed to be deliberately placed within two lower courses of mudbricks.

Building 80 (Spaces 135 and 373)

Introduction

This year saw the continued excavation of the occupation sequence of this structure. Once again much of the work focussed on the central clean and southern floors of the northernmost space of the building. These linked into the sequence of floors and burials in the platforms (F.3442 north-west platform and F.3441 northeast platform). Work also continued on the oven and hearth sequence in the south half of the main northern space continued to be excavated and the ladder platform (F.3437) located in the southeast corner was finally completely removed. Unfortunately excavations in the building were not completed due to the foreshortened excavation season. There is very little left to excavate in this building and what remains mostly appears to be related to the remaining floor sequence (Fig. 16). The aim next season is to finally completely excavate the occupation sequence of this structure.

Structural posts

The earliest excavated elements of this structure, this season were a couple of burnt posts. The first of these was in the southeast corner of Sp.135, F.3429, which contained a charred or burnt post (18951), (c.0.10m by 0.40m) and was situated against the eastern wall in the centre of platform F7401.

In the northwest corner of the space a burnt post (18959) formed part of F.3431, and was situated against the western wall marking the step down from the northwest platform F.3442 and the central floor. This post and posthole, were sealed by grey- reddish brown silt-clay fill (18940), which contained occasional bone, stone, mini-clay balls, clay objects, obsidian and shell fragments. This was deemed to be similar to the upper fill of F.3428 (18939), a better surviving post that it was paired with engaged with the up-standing eastern wall of the space, excavated in 2010, which yielded a denticulated obsidian blade. This post was probably associated with an obsidian cluster (18944), which was found upon the platform, immediately adjacent to it's north side in 2010.



Figure 16. East-facing overview of B.80 at end of excavation 2016 (photograph by Jason Quinlan).



Figure 17. West-facing view of post structure F.3433 (photograph by Katy Campbell).

Post structure F.3433

Further work was also carried out and the post structure F.3433, situated against the eastern wall of Sp.135, and also partially excavated in 2010 (Fig. 17). The post-hole itself (19198) was shaped to accommodate three posts, which were subsequently plastered over. Two of the burnt posts were recorded this season, (18960) and (18961). These were subsequently filled with a loose mid-grey brown slay silt (19194), associated with cluster of obsidian and small pebbles found in the upper part of the fill which sealed the carbonised post (18965).

These were sealed with post-hole fills: loose orange and grey white with brick debris (18950) and light grey clay silt (19197), before being finally sealed by the plaster (19199) on the curb that lipped up along the base of the western wall of B.80, F.5036.

Occupation

These western posts were sealed by a white marl plaster floor (19196) covering the southeast corner of the northwest platform, F3442, which levelled out at an average height of around c.1008.40m ASL. This was equated with the floor and associated makeup deposit (19195) on the east-central platform, F.7411. This sealed a central floor (19186), which was essentially a compound layer containing sterile white plaster surfaces and their associated makeup, to a height of approximately 1008.34m ASL. This was sealed by a short and quite sterile sequence of surfaces and associated makeup deposits including another white plaster floor (19193), and a further makeup layer (19192), which in turned tied into the east-central platform surface (21774) excavated in 2015. These plasters tended to be thinner towards the western side of the platform, apparently indicating wear, with thicker deposits situated against the wall in the east.



Figure 18. North-facing photo of hearth F.7402 (photograph by Katy Campbell).

Hearth F.7402

The main central floor (19186) was cut by the scoop for a large structured hearth (19184), between 0.62-0.69m in diameter, up to 0.16m deep. This formed the foundation of the pyrotechnic installation (structured hearth) which was constructed around it F.7402 (Fig. 18). The edge of the hearth was made up with a pisé-like surround (east: 19174) and (west: 19175), which were c.0.15m wide by c.0.12m high. Before being packed with plaster (19176), and filled by a number of deposits. The first of these (19173) was a laminated ash, with plaster fragments, possibly rake-out; the second (19172) was an orange brown clay packing in the north-eastern section of the hearth, which may have been for resting cooking pots upon; finally (19171) was a final typical hearth deposit, a dark grey slightly clay, ashy silt.

Southern floors and ladder platform

The hearth structure was apparently contemporary with the southern [dirty] floor (19185) a mid-grey slightly silty clay surface at c.1008.29m ASL (Fig. 19). This surface filled the lower area between all the southern features of the space, including the ladder platform (F.7425), the south-western platform (F.7423) the east central platform and horned bench (F.7411) and the central hearth (F.7402). Its south-easternmost portion was sealed by another group of eroded dirty ash rich clay floors (19182), a compound laminated layer, which lipped down from and formed a surface upon the southeast ladder platform (F.7425).

This was contemporary with the mid grey silt-clay (with orange and white inclusions) floor packing for the ladder platform (19181), which appeared to have been preserved under the lean of the ladder itself. These were in turn cut by the ladder cut itself (19180) and associated with the fill of a small adjacent 'erosion scoop' (19179) that was also situated in the platform. This 'scoop' (c.0.49m long, by c.0.36m wide) was interpreted by the excavators as part of the use-wear pattern of the platform, prior to it being levelled and replastered at a later date.



Figure 19. South-facing view of the southern half of Sp.135 in B.80 (photograph by Jason Quinlan).

Stratigraphically, these surface features on the platform appeared to be concurrent with with a raised platform blocking/makeup event (19178) between the ladder platform and its neighbouring platform F.7423 to the west. Here the ground between them was raised up *c.*50mm by a mid grey silty clay, before being sealed and finished by another light grey-white plaster surface (19190) at a height of *c.*1008.34m ASL. The plaster surface (19190) also appears to have been stratigraphically contemporary [?] with another packing/makeup layer (19177), which formed part of the core/structure of the southwestern platform F.7423 and was not fully excavated at the end of season. Here the sequence linked into previous excavation work, feeding in turn into a sequence that was first identified in 2015. Plaster surface (19170) was also situated under clay makeup layer (22424), which was finally sealed by a further plaster packing layer (19176) under the floor (21759), both excavated in 2015.

A further mid grey silty-clay 'scrappy' [patchy?] packing event (19170) finally sealed this short sequence, which may have covered more of the southern part of the space to the north of the 'blocking/makeup', possibly forming another dirty floor. This was in turn sealed by a makeup deposit (22425) and an oven base (22418) both excavated in 2015.

Chapter 4

Excavations in the TPC Area

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Introduction

The works in the TPC Area commenced in the 2016 excavation season were carried out in Trenches 3 and 4 located directly east of the South Shelter (Fig. 1). Trench 3 is located in the southern part of TPC Area. It is quadrilateral in shape with the southern and eastern edges being 10m long and the northern edge measuring 6m in length. Trench 4, measuring $c.8 \times 6$ m, is located between Trench 3 in the south and Trenches 1 and 2 in the north. Trenches 1 and 2 were not excavated in the 2016 season. Trench 1 is 5×5 m is located directly to the south of Mellaart Area A. Trench 2 is directly south of Trench 1 and its overall dimensions are 5×6 m. Four excavation seasons have been carried out to date in these four new trenches.



Figure 1. TPC Area in relation to other excavated areas.

One of the main goals of work in the TPC Area is to link the stratigraphy of the TP sequence, excavated between 2001 and 2008, with the stratigraphy of the South Area. It further aims to recognize architecture, burial practice, pottery and obsidian manufacture and use, subsistence, landscape use, etc. in the period between the end of the South sequence (Building 10, Level South T) and the beginning of the TP sequence (Building 81, Level TP M) (see more Marciniak 2015; Marciniak *et al.* 2012), as well as to overlap with the uppermost levels in the South Area occupation sequence and the lowest parts of the TP Area sequence.

The excavations carried out in the past four seasons have made it possible to reveal a sequence of Neolithic buildings and features in three excavated Trenches: 1, 2 and 3. Altogether, the remains of four buildings (B.121, B.110, B.115, B.109) in Trenches 1 and 2 and two (B.122, Space 520) in Trench 3 have been unearthed. The works in Trench 4 conducted to date were concentrated upon post-Neolithic occupation phases. To date, only unspecified remains of Neolithic architecture have been revealed (Filipowicz *et al.* 2014; Marciniak *et al.* 2015).

Excavations in Trench 4

The walls of a large Neolithic structure labelled B.150 were discovered in the 2015 season (Marciniak *et al.* 2015). The work carried out this year made it possible to reveal some details of its construction and subsequent intense occupation and periodic reconstruction. In particular, major elements of the final phase of the building were revealed and excavated (Space 594) (Fig. 2). It consisted of a solid floor (F.8276) in its central part and a sequence of in-built structures including four platforms against the eastern wall of the building and three platforms in its southern and central area. Neither floor nor any kind of in-built structure representing the original construction of the building and its use were reached this year. Hence, an outline of the house history presented below is incomplete and the interpretations provided are preliminary.

Building 150 was most likely used for a long time. It has been significantly reconstructed and rebuilt at least three times, as indicated by a sequence of floor deposits, revealed in the section of a large Hellenistic pit in the southern part of the building, along with corresponding platforms and fire installations.

The last phase of B.150 (Space 594) is recognized by a clearly distinguished and well-preserved dirty floor. The floor (F.8276) is made of a sequence of three distinct deposits (31858), (20729) and (31849), respectively. Each of them had a similar texture and was composed of a number of superimposed striations of grey plaster and very thin layers of makeup. This is indicative of an intense use of the floor and its subsequent numerous reconstructions. The southern part of the floor was partly placed beneath wall F.3852 of later B.152, constructed after the abandonment of B.150 (see below). The floor was very clean and only a very small number of animal bones, sherds and obsidian was found. A small fire spot (F.8290), used in two distinct phases of the floor use, was located in the northern part of the building. It is a light fire installation with no superstructure of any kind. Interestingly, a fire installation was placed directly beneath a similar fire spot from the room fill.

A sequence of superimposed fire installations, one fire spot and three ovens, built on a distinct rectangular platform (F.3873) in the southern part of the building, was revealed. The platform was constructed against some kind of earlier largely destroyed platform from the preceding occupational phase, which itself was most likely built against the southern wall of the building. The platform F.3873 was constructed against another platform located directly to the west (F.8284). It was long in use and served as a place for numerous fire installations built one on top of the other. The



Figure 2. B.150, Sp.594: An orthophoto of the final occupational phase, Trench 4.

most substantial of them was a large oven F.8278 (Fig. 3). This is a regular, squared structure with a distinct floor and solid superstructure made of walls preserved to the height of 20cm.

One of the most interesting discoveries in the 2016 excavation season was a complete ceramic vessel (Fig. 4). Its stratigraphic position is indicative of its deliberate deposition in relation to one of the reconstructions of the southern platforms in B.150. It was placed directly north of a large oven belonging to an earlier occupation phase of B.150 (Sp.612) and deliberately deposited right beneath the northern edge of one of the later platforms (F.3873), shortly before its construction. The pot was placed in a circular and regular pit (F.3850), most likely deliberately prepared for this purpose. It was dug onto the earlier floor of B.150 (Sp.612). The full extent of this oven and its corresponding floor were not completely exposed during the 2016 season.

Another important architectural feature is a sequence of two platforms located in the central and southern area of Sp.594. The earliest one, F.8284 (Fig. 5), is rectangular in shape and was built against an earlier platform, which itself is located directly against the southern wall of B.150. A large platform (F.8279) from the same chronological horizon was built further to the North in central part of Sp.594. It was a very fine construction built with care and precision. The platform was



Figure 3. Space 594: oven (F.8278), Trench 4.



Figure 4. Space 612: complete vessel (F.3850), Trench 4.

intensively used, as indicated by numerous reconstructions and enlargements. It involved adding outer facings to its eastern, northern and western sides. As a result of this reconstruction, the platform was enlarged towards the north. The platform was most likely built right after the construction of the latest floor (F.8276).



Figure 5. Space 594: platform (F.8284), Trench 4.

The most distinctive element of the last phase of B.150 is a sequence of four platforms and three benches built against eastern wall of the building. The sequence is as follows, as seen from the northeast to the southeast corner of the building: (i) platform: F.3857; (ii) bench: F.8298; (iii) platform: F.8289; (iv) bench: F.8299; (v) platform: F.3855; (vi) bench: F.3859; and (vii) platform: F.8275 (Fig. 6).

Out of this sequence of platforms and benches, only a centrally placed platform (F.3855) was excavated this year. One surface of the platform (20737) consisted of a c.3cm thick layer of white homogenous plaster composed of numerous striations. It was followed by a very distinct, homogenous layer of loose light beige sand, most likely deliberately selected from around the site. It was then followed by a layer of dark brown sand with organic inclusions (20736) placed directly on the top of the earlier platform. Two burial pits were dug into this central part of the platform (F.3868 and F.3867) (Fig. 7). They were not contemporaneous, as the latter was truncated by the former. Neither of the burials has been completely unearthed this season, hence they cannot be described at this point. Both burials may have been reopened a number of times, as indicated by numerous carefully plastered layers in their fills. Interestingly, numerous loose human bones and teeth were found in the fills of both burial pits.



Figure 6. Space 594: platform: F. 3857; bench: F. 8298; platform: F. 8289; bench: F. 8299; and platform: F. 3855, Trench 4.



Figure 7. Space 594, platform F. 3855: burial pits F.3868 and F.3867, Trench 4.

In the northeast part of the makeup layer (20736) of platform F.3855, right beneath its plastered surface (20737), next to the eastern wall of B.150, and right by the northern edge of burial F.3867 two complete anthropomorphic figures were found (Fig. 8 - and see Figurines chapter for further details). Their deposition is most likely associated with the platform construction and it may have been contemporaneous with the closing of the adjacent burial (F.3867). They have been deliberately placed on the surface of an earlier platform and then covered by two layers of makeup: a homogenous light brown sandy layer followed by equally homogenous dark grey layer. They were then plastered over by a 3cm thick layer of white plaster. The large standing female figurine (20736.x1) was made of marble. It survives complete and it is c.17cm long, 11cm wide and 9cm thick. It weighs more than 1kg (see Figurines chapter Figs. 2-3 and 8-10). The hands are folded under the breasts, which are splayed to the side. Other features depicted include the eyes, mouth, chin, neck fat, the back of the head roll. The hands and feet are disproportionately small compared to the rest of the body. The second figurine, 20736.x3 was deposited immediately north of the larger figurine and was placed inside a lump of marl, itself dumped into the makeup layer. Near the head of that figurine a piece of galena and two blue beads were found. It is c.7cm long, 4cm wide and weighs around 55g. This a pale yellow standing female figurine carved from limestone (see Figurines chapter Figs. 6-7 and 11-15). The figurine has an elongated face with finely modeled face with eyes, nose, mouth and ears rendered in a realistic way. Two perforations are placed on top of the head. Its hands are placed on the breasts and the legs are joined.



Figure 8. Space 594, platform F.3855; depositional context of marble figurine (20736.x1), Trench 4.

Building 150 is the earliest building in this part of the TPC Area. It is one of the largest houses found on the summit of the East Mound in the TP and TPC Areas. Based on its stratigraphic position and the character of its construction, the building can be tentatively dated to Level TP-M, which is

contemporaneous to Level III/IV in the Mellaart phasing scheme. This level seems to represent the final phase of the classic Çatalhöyük occupation. The building appears to be contemporary with B.121 in TPC Trench 2 (Marciniak *et al.* 2013) and most likely B.122 from Trench 3.

Following the abandonment of B.150, as marked by a number of fill deposits (Sp.493), another Neolithic building (B.152) was constructed. Some elements of this structure were partly unearthed in the 2015 year (see Marciniak 2015; Marciniak *et al.* 2015). The excavations of B.152 were completed this year. The building can only be partially reconstructed, as its southern part is outside the limit of excavation. Its northern part is made of three small rooms serving unspecified purposes. Neither floor nor any inbuilt structures have been recorded. The relationship between these two superimposed dwelling structures has been established. They mark a major reconstruction of earlier B.150 and the beginning of a new type of dwelling structure characteristic of the latest Neolithic occupation levels at Çatalhöyük.



Figure 9. B.152: An orthophoto of the remaining walls, Trench 4.

The work this year concentrated on excavating the remaining walls of B.152 (Fig. 9). These comprised a solid northwest-southeast wall (F.3852) and two perpendicular walls (F.3850, F.3851). Each of these walls was bonded together, indicating they were built at the same time and comprised a part of the same dwelling structure. This is further corroborated by a similar shape and size of the bricks. All these walls were built directly on top of the structures belonging to the latest occupation phase of B.150 (Sp.594), including its floors and platforms. The northern wall (F.3852) was erected directly on the underlying features F.8257 and F.8258. The easternmost perpendicular wall (F.3850) was built directly on top of the earlier wall F.8259. Further to the south, another small

wall (F.3851), parallel to the latter and perpendicular to the northern wall, was placed right below F.8260 (see Marciniak *et al.* 2015). It is worth noting that this wall was constructed following a deliberate removal of a section of the eastern wall of B.150. This wall is placed directly upon an original basal part of the wall of B.150. There are some indications that older bricks were reused during its construction. After removing the walls of B.152, it was possible to re-define the character of features directly beneath (see Marciniak *et al.* 2015) and recognize the last occupation phase of B.150.

Excavations in Trench 3

The work in the 2016 excavation season was concentrated in the central and southern part of Trench 3. A narrow space, (Sp.521), adjacent to southern wall (F.3891) of a large storage room Sp.493, was initially recognized in 2013 (Marciniak *et al.* 2013) and completely excavated this season. The main objective of this work was to establish the stratigraphic relationship between this longitudinal space, clearly belonging to one of the latest phases of B.122, structures from earlier phases of its occupation in its south-central part (Sp.517 and Sp.562), as well as distinct Sp.493 directly to the north, defined as a dedicated storage room with bins for wheat and barley (Marciniak *et al.* 2013).

Space 521 has an elongated shape and is located between the northern, southern and western walls (F.3891, F.8253 and F.7194 respectively). An internal wall of B.133 (F.7194) was recognized in earlier seasons and almost completely excavated in 2015 except for its easternmost section that was only removed this season. Space 521 appears to be an unspecified platform/floor (F.8294). After going out of use, it was backfilled by a heterogeneous rubble deposit (20791). Space 521 is an integral part of B.122, most likely marking its final reconstruction and use and it appears to be contemporary with Sp.517 in the central-southern part of the building (see Marciniak *et al.* 2015).

The work in the 2016 season also made it possible to reconstruct a life history of B.122, marked by numerous reconstructions and re-buildings. However, the earliest phase of B.122 has not yet been revealed. Its first major reconstruction comprised a construction of a distinct storage room (Sp.493) (see Marciniak *et al.* 2013, 2015). Most likely it was built in the place of the eastern platform of the building; however, it is difficult to estimate how long the original building might have been in use before the storage room was constructed. Similarly, it is difficult to estimate a time span between the construction of Sp.493 and the construction of Sp.562 directly to the east, whose most distinct elements comprise the eastern platform built against the western wall of Sp.493 and the geometric painting of its outer walls. The subsequent reconstruction marked a closure of this space by carefully placed mudbricks (Sp.517) (see Marciniak *et al.* 2013, 2015). The stratigraphic relationship between Sp.517 and Sp.521 further to the east and excavated this year (see below) were reexamined this year. As mentioned above, it appears that both structures were most likely contemporaneous.

The original purpose of Sp.493 remains unknown. It cannot be ruled out that it served a storage purpose from the beginning of its construction. It remained in use until the very end of the occupation of B.122, represented by Sp.521, as these two distinct parts of the building were used at the same time. It is indicated by a crawl hole between Sp.493 and Sp.521, which is located in the southeast part of the dividing wall. This kind of stratigraphic relationship implies that Sp.493 was also in use when the western part of B.122 was reconstructed and converted into a room with a ceremonial character (Sp.562). Accordingly, it is most likely that the room was also used as a storage facility when its outer walls were painted over in an elaborated geometric design. Hence, the most likely scenario is that Sp.493 was originally constructed as a storage room and served this purpose for a long time, both during the construction and use of a ceremonial part of the building (Sp.562), as well as during subsequent reconstructions (Sp.517 and Sp.521) of B.122.

As access from Sp.521 to Sp.493 through a relatively large and oval crawl hole has been unquestionably established, it remains unclear how the storage room was accessed during earlier phases of its use, in particular during the occupation of Sp.562. It may either have been accessed through the same opening as in the final phase, or most likely by a corresponding opening somewhere beneath the floor/platform (F.8294) of Sp.521. This, however, cannot be verified as excavating this sequence is beyond the scope of work in the TPC Area. However, it cannot be ruled out that Sp.521 comprised the remaining part of the eastern platform of the original B.122, the larger part of which may have been truncated later during preparation of the space for the construction of a storage room (Sp.493). However, this scenario is unlikely as the floor of Sp.521 was built against the wall F.7176, which is certainly later than the original wall of B.122. Hence, it is most likely that Sp.493, in its phase contemporaneous with the existence of Sp.562, was also accessed from the south, most likely from some kind of platform/floor directly beneath its successor (F.8294) in Sp.521. This interpretation is further corroborated by the presence of two steps from the western side of the latter platform, which may indicate that it had either undergone some unspecified reconstructions or that we exposed a small section of the sequence of platforms/floor, the lower part of which belongs to an earlier phase. This can only be clarified by fully excavating the stratigraphic sequence. The storage room Sp.493 was deliberately destroyed by fire, which most likely meant its closure. Following this conflagration the crawl hole was blocked by a pile of bricks and bricky deposits. They were placed directly on the surface of the floor/platform of Sp.521. This closure meant that Sp.493 went out of use.

By exposing the northern wall of Sp.574 (see Marciniak *et al.* 2015), it was possible not only to define its stratigraphic relation to wall F.7176 but also to the floor/platform (F.8294) of Sp.521, placed between the wall F.7176 to the south and the southern wall of Sp.493 to the north. The wall F.8253 of Sp.521 was most likely functionally related to the latest flooring event in this space (F.7199). Space 521 in its latest phase might have been backfilled and separated from the continuously occupied main room (Sp.517). However, its final function remains unclear due to significant damage by post-Neolithic truncations and a lack of any features and finds. By analyzing the stratigraphic relationships in this part of the trench, it became clear that the platform/floor F.8294 was constructionally related to the floor of Sp.517, which extended a bit further to the west. This makes the platform/floor most likely contemporary with Sp.517.

This year's work was not aimed at excavating the floor layers of Sp.562 and Sp.517. However, the work in Sp.562 involved the consolidation of all features exposed in the past season (Marciniak *et al.* 2015) and taking some samples for the radiocarbon dating project. A podium/pedestal (F.8291) from the western edge of the platform, along with a badly preserved bucranium (31803.x1), were removed this season. The pedestal has the following dimensions: 0.75 x 0.22 x 0.30 m.

This year's excavations also made it possible to refine a stratigraphic sequence in the southern part of Trench 3. Its main part comprises a sequence of superimposed rectangular structures with distinct and well-preserved walls. The latest in the sequence was Sp.520, excavated last year (Marciniak *et al.* 2015). Directly beneath were two contemporaneous Spaces 574 and 575. The oldest in the sequence was Sp.515.

Excavations directly to the south of Spaces 562, 517 and 521 from B.122 focused on refining the character of Spaces 574 and 575 and stratigraphic relations between them. The northern walls of both spaces abutted the wall F.7176. Both spaces were placed beneath Sp.520 excavated last year (Marciniak *et al.* 2015). As the uppermost parts of the walls of both spaces were at the same level on which the walls of later Sp.520 were constructed, they may have been contemporaneous.

Space 574 is located in eastern part of the southern section of Trench 3. It has four very distinct walls: F.7484 (western), F.7485 (northern), F.7487 (eastern) and F.7488 (southern). The southern and northern walls were destroyed by post-Neolithic truncations. The wall F.7488 was truncated by an early Hellenistic bell-shaped pit (F.3869), while the northern wall F.7485 was truncated by a large ovoid pit (F.3877) that also truncated the platform (F.8294) in Sp.521. The work in Sp.574 involved also removing its infill, units (20757) and (20784).

Space 575 is located in the central-western part of Trench 3. Two of its walls F.7489 (northern) (Fig. 10) and F.3872 (eastern) are in the trench while the western wall is placed outside the limit of excavation. Directly beneath both walls, two walls belonging to earlier Sp.515 were revealed. Two of its walls: F.3878 (northern) and F.3879 (eastern) were excavated during the 2016 season. Platform F.7173, exposed in 2015 (Marciniak *et al.* 2013), belongs to this space.



Figure 10. Space 575, wall F.7489, Trench 3.

Final remarks

The aim of the 2017 field season in Trench 4 is to excavate all remaining occupation phases of B.150 and, in particular, to recognize the layout and character of the original phase of the building. As regards Trench 3, the work next year will focus upon refining the stratigraphic relationships between Spaces 515, 574 and 575, as well as the relationships between Buildings 122 and 133. The ultimate goal of these works is to establish a stratigraphic relationship between the TPC Area in Trench 3 and the South Area, which can be achieved by excavating different parts of Sp.515.

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Cultural and Environmental Materials

Chapter 5

Human Remains

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Introduction

The Human Remains Team for 2016 comprised Christopher Knüsel (Université de Bordeaux), Scott Haddow (Université de Bordeaux), Barbara Betz (Ohio State University), Marco Milella (University of Zurich), Eline Schotsmans (Université de Bordeaux), Evan Garofalo (Arizona State University), Jessica Pearson (Liverpool University) and Sophie Moore (Brown University).

In all, a total of 35 individuals were excavated during the 2016 season: 20 Neolithic individuals from the South Area and 15 individuals from the North Area (14 from the Neolithic and one Post-Chalcolithic). These are described by excavation area below.

North Area Neolithic burials

Building 5

F.3808, Sk (22195, 22196), Cut (22193), Fill (22194)

F.3808 refers to a burial located in the southern side of platform F.3811, Space 154. The burial contained two secondary depositions that may be related to the same event.



Figure 1. F.3808, Sk (22195) in Building 5 (photo by Jason Quinlan).

The uppermost deposition, Sk (22195), is an east-west oriented cluster of partially disarticulated postcranial axial and appendicular bones (Fig. 1). These bones appear to have been wrapped in a plant-based material which left a high concentration of phytoliths on the outer surface of all bones in the bundle and the surrounding soil matrix. The phytolith wrapping left a highly directional pattern of thick stripes oriented perpendicular to the axis of the bundled long bones. Buried relatively close to the floor of B.5, which had been exposed for many years, the bones of this bundle were highly fragmentary and poorly preserved. The upper central portion of the bundle consisted of an articulated lower spinal column, including the sacrum, all five lumbar vertebrae, and thoracic vertebrae 9 through 12. On the west side of the bundle, a femur was completely hyperextended behind and parallel to vertebral column, along with a number of other fragmentary long bones including fragments of at least one humerus, tibia, and fibula. Two *ossa coxae* rested directly under and east of the vertebral column, along with a scapula with glenoid fossa oriented to the south. This bundle was found in the southern half of a wide and relatively shallow cut which was otherwise empty. The southern edge of the grave cut for F.3808 intersects another burial (F.3810) and its bottom appears to have disturbed an even earlier burial (see description of F.3813 below).



Figure 2. F.3808, Sk (22196) in Building 5 (photo by Jason Quinlan).

Only a few centimeters below the bottom of this bone bundle, the upper portion of the frontal bone of Sk. 22196 was uncovered (Fig. 2). Sk (22196) is a secondary deposit composed of a partially crushed, cinnabar-painted (and perhaps plastered) skull (cranium and mandible), which had been placed in a complex organic container (22196.x1). This container was composed of a round, flat wooden base and a layer of woven organic plant material that may have been either matting or a shaped basket. Inside the container, the skull had been placed upright and facing east. Two flint

daggers (22196.x3, x4) were found inside the southeast edge of the container below and next to the facial bones of the skull, as well as a shell (22196.x2) which rested just north of the upper jaw. Outside the container, positioned behind the posterior of the skull and west of the container as a whole, was a concentration of objects including four obsidian projectiles (22194.x2-x5) pressed into a bundle of some kind of fibrous plant material, one “macehead” type groundstone object crafted from white marble (22194.x1), and a shell containing a substantial amount of cinnabar residue (22194.x6). According to chipped stone specialist Sean Doyle, all chipped stone objects found within this feature were made from high quality materials and exhibited skillful craftsmanship. Upon preliminary examination, none appeared to have any evidence of use-wear. The quality and location of these items suggest that they were placed intentionally in the Neolithic as grave inclusions.

It is unclear whether Sk (22195) and Sk (22196) were interred together in one depositional event or separately in multiple depositional events. A lack of clear anthropological differences between the two secondary bone deposits, as well as a lack of repeated skeletal elements, suggests that skull (22196) may have belonged to the same individual as the postcranial remains in bundle (22195). However, poor preservation and the absence of certain skeletal elements make it difficult to either confirm or refute this hypothesis. It is possible that aDNA research will shed light on this question in the future.

F.3810, Sk (32205), Cut (32200), Fill (22199, 32201)

F.3810 contained the primary burial of an adolescent located in the southern area of platform F3811, towards the western side of Sp.154. The body was placed in a tightly flexed position on its left side with the cephalic extremity to the south (Fig. 3). The northern edge of the cut was slightly truncated by the cut for burial F.3808 (22193), which cuts underlying burial F.3813. The bottom of the cut for F.3810 cuts another burial that has not been excavated and has been assigned a skeleton number only, Sk (32208). It is also possible that the bones in the fill were deposited at the same time as Sk (32205). No artifacts were found in association with this burial.



Figure 3. Burial F.3810, Sk (32205) (left); grave cut for B.3813 and F.3808 (right) in Building 5.

The soil of burial fill (32201.s4) had an alkaline pH of 7.43 with a conductivity of 7.742mS (Munsell color 10YR 6/3 pale brown). Soil taken near the bone Sk (32205.s2) showed a pH of 7.51 and conductivity of 7.373mS (Munsell color 10YR 6/4 yellowish brown).

F.3813, Sk (22197), Cut (32206), Fill (32207)

F3813 is a burial situated beneath platform F.3811 (Sp.154) containing the disarticulated bones of at least two individuals: the cranium and mandible of a juvenile, Sk (22197), as well as infracranial bones from at least two subadults: one aged between 6-8 years and another 10-12 years of age at death. It is likely that the cranium and mandible Sk (22197) belongs to one of these two individuals. Due to time constraints, however, a complete laboratory assessment of the bones was not completed this season.

It appears that the cut for the later secondary depositions F.3808 had disturbed/displaced these individuals since most of the bones and the cranium and mandible were found along the south-western side of the grave cut (Fig. 3). This would explain why the body was largely disarticulated: it was a consequence of its displacement from an originally primary deposition to what now appears as a primary disturbed loose deposition. Another possibility is that the bones in the fill (32207) belong to one or more burials originally located somewhere else and relocated here later. In this case the burial would also represent a secondary deposition. No artifacts were found in association with this burial.

The soil of burial fill (32207.s3) had an alkaline pH of 7.31 with a conductivity of 8.251 mS (Munsell color 10YR 6/3 pale brown). Soil taken near the bone Sk (22197.s1) showed a pH of 7.58 and conductivity of 7.478mS (Munsell color 10YR 6/3 pale brown).



Figure 4. Burial F.3814, Sk (32211) in Building 48.

Building 48

F.3814, Sk (32211), Cut (32209), Fill (32210, 32212)

F.3814 is the primary undisturbed burial of a child lying prone with flexed limbs, located in the south-western side of Sp.239. The cephalic extremity, which was lying in the southern side of the burial, the cranium of which was facing north and rotated left. The feet are oriented to the northeast. Except for the poorly preserved cranium (partially exposed already before the beginning of excavation), the rest of the bones were in good condition. No artifacts were found in association with this burial.

Building 131

F.7962, primary burial Sk (31705), secondary deposits Sk (22685, 22686, 31704, 31706, 31707), Cut (22680), Fill (22678)

F.7962 is a burial located in the northeast storage room of Building 131. It contained one articulated primary burial of an adolescent Sk (31705) aged approximately 15 years at death, as well as multiple disarticulated subadult individuals Sk (22685), (22686), (31704), (31706), (31707) ranging in age from infant (under 2 years) to adolescent (approximately 15 years). This feature was partially excavated

in 2015 (see 2015 Archive Report) and was finally completed in 2016. The bones within this unit all appeared to be heat-affected due to the burning in B.131. Additionally, several heat-affected wooden objects were intermingled with the disarticulated skeletal elements within the burial fill, some of which had a convex, bowl-shaped appearance (22678.x1-6). Beads, shell and an obsidian tool were also found within the burial fill.

Sk (31705) seems to be the lowermost and best articulated individual interred in F.7962. The body had been placed in a tightly flexed position on its left side with the cephalic extremity toward the north. Additional wooden objects (22678.x5, x7, x8) were found lying just over the area of the rib cage, but under or at the same level as the infracranial remains of a subadult of a younger age at death than Sk (31705). These remains may have been intentionally placed over Sk (31705), or may be more directly related to the secondary interments of the other individuals found higher in the grave cut (see 2015 Archive Report).



Figure 5. Burial F.7962, primary adolescent burial Sk (31705) in B.131 (cranium has already been removed) (photo by Jason Quinlan).

After preliminary examination, project anthracologist Ceren Kubukcu determined that object 22678.x7 and 22678.x8 (a wooden stick or small branch) was most likely a branch of almond wood, and found that the bark indicated the branch had likely been cut or broken off in winter or fall. These results are preliminary and will have to be verified during the off-season.

The orangey-tan organic substance found under the cranium, neck (x1), long bones and elsewhere is likely the remains of an animal hide that had been wrapped around the individual at the time of interment. This wrapping may explain why the bones of this individual were not disturbed when the cranial and infracranial remains were placed on top of it in the burial cut.

A thicker yellow-orange organic material (x2) found lying over the lower left ribs in the abdominal area may be the remains of animal fur or hair from something formerly lying on or near the left wrist. The left hand appears to have been disturbed while soft tissue still held the phalanges and metacarpals in partial articulation. The 2nd to 5th proximal phalanges were lying in a row perpendicular to the direction of the metacarpals a few centimeters away from the rest of the hand, but the distal phalanges were tucked between the right ribs and right elbow as if the left hand had at one point been lying palm down over the right rib cage before soft tissue disappeared and the rib cage and abdomen collapsed inward. While most of the left wrist appeared to be articulated *in situ*, at least three carpals were found below the left forearm overlying the visceral surfaces of the left lower ribs with the organic material. Perhaps some sort of garment or decorative item made of hide or fur fell into the collapsed abdominal cavity as the burial settled and pulled some bones out of articulation as the body decayed.

F.7961/7963

F.7961, Sk (30040), Cut (22679), Fill (30039, 22675)

This incompletely excavated feature, initially uncovered in 2015, appears to include units from multiple, separate depositional events, some of which are difficult to distinguish from the units in F.7963. When excavation of the northeast platform F.7952 began in 2015, there appeared to be two distinct burial cuts that were visible on the surface of the platform and were assigned separate feature numbers (F.7961 and F.7963). However, as excavation proceeded, it became clear that these two features included multiple intercutting burial events which did not always exhibit easily distinguishable cuts. The upper fill (22675) of F.7961 was excavated in 2015 and contained only loose, small skeletal elements. In 2016, a fragmentary cranium Sk (30037) – possibly of an infant or young child - was found resting against the northwest face of the cut. This cranium was in extremely poor condition, and essentially disintegrated into a reddish-brown powder during cleaning. Below fill (22675), along the southeast edge of F.7961 and the northern edge of F.7963, several disarticulated long bones and loose juvenile skeletal elements were found in fill (30039). This unit was not fully excavated in 2016.

F.7963, primary burials Sk (30040, 30044), secondary deposits Sk (30043, 32322, 32330, 32369), Cut (22681), Fill (22676, 30036, 3008, 30039, 32390)

This feature, incompletely excavated in 2016, contained the primary, secondary, and primary disturbed remains of at least six adults based on cranial and long bone counts (Fig. 6). Multiple, separate intercutting burial events are contained in this feature, as cuts are intermingled and were difficult to delineate. This feature has not been completely excavated. As such, the interpretation of the burial sequence provided here is provisional until this feature is completely excavated.

Sk (30040) is a primary or possibly secondary inhumation of an adult of as yet undetermined sex. It is the northernmost burial in F.7963 (Figs. 6 and 7). It appears that after the individual was placed in the grave cut, a white plaster material (32390) was subsequently applied over the remains. The plaster was sampled (32390.s4) for characterization as lime or gypsum plaster. Given the displacement/separation of the bones of the right elbow, it seems that the body was at least partially decomposed when it was placed in the cut. The sacrum and right *os coxae* were also slightly displaced. Pieces of well-preserved woven textile (22676.s5) were found within the plaster around the individual's pelvis and sacrum. The position of the lower limbs is unclear. It is possible they were disarticulated prior to burial, or disturbed by a later interment event. The plaster fill (32390.s4) had an alkaline pH of 8.02 and conductivity of 6.887 mS (Munsell color 10YR 7/1, light grey).

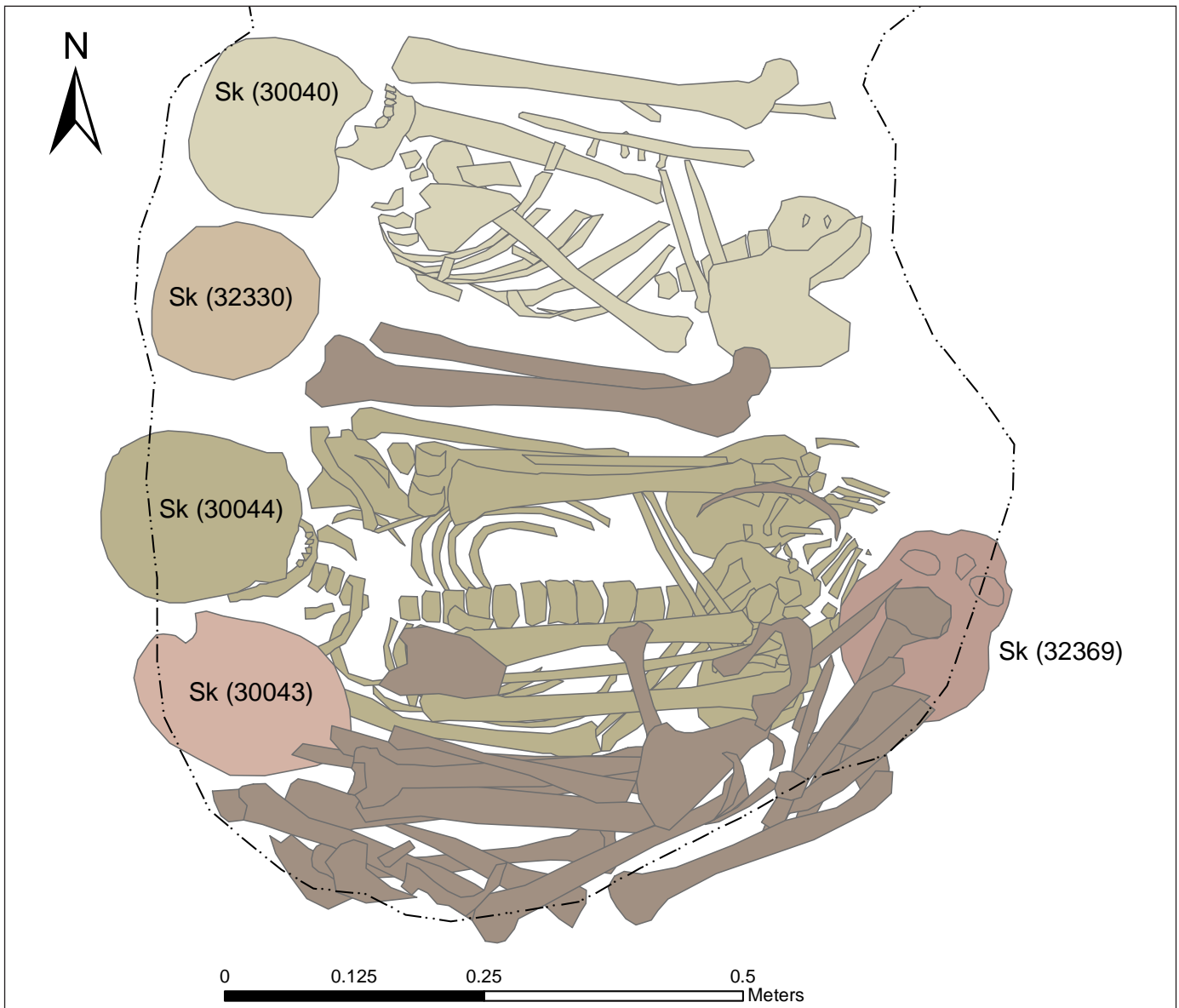


Figure 6. Plan of burial F.7963, B.131, showing location of primary and secondary skeletons described in text.

The deposition of Sk (30040) seems later/cut into that of Sk (32330) (reddish-orange pigmented cranium - not yet fully excavated in 2016). While Sk (32330) was initially interpreted as a loose, isolated cranium placed as a secondary deposition with of Sk (30040), this scenario now seems unlikely given the position of Sk (32330) below Sk (30040) and outside of the plaster infill. Thus, cranium Sk (32330) was likely an earlier event (see further discussion in description of F.7963 below). Additionally, the fill above this individual rests between the cuts defined in 2015 for F.7961 (cut 22679) and F.7963 (cut 22681), and was initially excavated in 2016 as F.7977, fill (30036).

Sk (30044) is the primary deposition of a tightly flexed and supine adult within the southern portion of F.7963 (Figs. 6 and 7). Based on cranial morphology visible during exposure of the skeleton, this individual is probably male. The upper limbs were lying loosely flexed, with the left forearm crossed over the right forearm with both overlying the lower abdomen. The ankles rested over the hands/wrists of the opposite limb. The wrists appear to have been extended, with the hands resting over the *ossa coxae*. A chert blade (30044.x1) was found lying directly over the bones of the

right forearm, above the abdomen. A thin orange-brown organic patch (30044.s6) lay under the left forearm but overlying the abdomen. A thick, circular patch of brown organic material with a thin orange outline (30044.s7) was found when the bones of the right ankle were removed. This may be continuous with (30044.s7), which is a patch of orange organic material within a thick layer of brown organic material under and south of the right metatarsal bones. Samples (30044.s8) and (30044.s9) are small portions of possible cord found associated with both feet.



Figure 7. Burial F.7963, B.131, primary skeletons Sk (30040) (top) and Sk (30044) (bottom) (photo by Jason Quinlan).

Sk (30043) is the southernmost cranium in F.7963 and located along the western edge of the cut. The superior surface of the cranium was oriented to the south and slightly elevated from the surface of the grave. The cranium was facing westward, toward the outside of the burial feature. The cranium does not appear to be articulated with other bones, but loose long bones from this southern area of the feature are likely to be associated, as well as placed in the southeast corner opposite this cranium. When the cranium was removed, a substantial amount of carbonized brain tissue was found (30043.s1). The body may have been relatively fresh and/or may still have contained brain tissue in the cranial vault at the time of deposition and/or burning episode, preventing it from being crushed when the burial was filled.

Sk (32322) is a partial, highly fragmentary cranium found in the central area of F.7963. Heavily disturbed by rodent burrows and partially mixed with fragments of a crushed adult unsided *os coxae*, it was partially overlying the right humerus of Sk (30040) in F.7961, and two loose femora north of Sk (30044). It is possible that these loose femora are associated with cranium Sk (32330), which may originally have been a primary burial later disturbed by subsequent cuts created for Sk (30040) and Sk (30044).

Sk (32330) is a cranium covered in red pigment and a thin white layer. It had been disturbed by animal burrowing and possibly by later burial cuts and uncovered but only partially excavated in 2016. Without further excavation, the nature of this deposition is unclear. The cranium is located to the south of Sk (30040), and at a slightly lower level. It may be a secondary inclusion in the cut made for Sk (30040). However, the nature of the plaster fill around Sk (30040) and the fact that this cranium is outside of that plaster fill suggest that this may be an earlier, separate deposition event. Just before the end of excavation of this feature in 2016, the proximal end of a right humerus was uncovered, as was the distal end of a femur. The position of these bones is suggestive of a flexed infracranial skeleton - possibly in articulation with cranium Sk (32330).

Sk (32369) is a loose cranium and mandible found along the southeast edge of the cut. Two *ossa coxae* were found lying opposite this cranium, partially overlying cranium Sk (30043). It is possible they were intentionally placed there in an approximation of an articulated flexed burial position, while loose long bones from at least two individuals were placed along the edge of the cut in a more random fashion. Unlike the other crania found in this feature, the cranium was crushed flat and may indicate that the bone was dry (i.e. defleshed) when it was deposited.

Fill (22676.s8) had an alkaline pH of 7.72 with a conductivity of 14.13 mS (Munsell color 10YR 5/1 grey), and fill (22676.s10) showed an alkaline pH of 7.99 with conductivity of 4.582 mS (Munsell color 10YR 5/1 grey).

F.7982, Sk (32324), Cut (30089), Fill (30086, 30090, 30091, 30092)

F.7982 contained the primary undisturbed interment of a middle adult possible female in platform F.7950. The body was placed in a tightly flexed position on its right side with the cephalic extremity oriented to the east (Fig. 8). The bones were highly heat affected due to the burning of B.131 after this individual was buried. The burning also preserved some carbonized remains of various parts of the body and samples of this material were taken from the area of the pelvis, abdomen (where it was visible on several vertebrae and ribs) and from inside the cranium. F.7982 is similar in position-



Figure 8. Burial F.7982, Sk (30040) in B.131 with wooden bowl (30092.x1) above left knee (photo by Jason Quinlan).

ing and grave goods/inclusions to neighboring burial F.7956 excavated in 2015 and located immediately to the east of F.7982 in the same platform.

A wooden bowl (30092.x1) was found laid on the body, seemingly around the left knee and overlying or near the right hand. Several beads 30092.x2-11 also found with these remains, including a bracelet around the mid right forearm (30092.x7) and several next to (but not around) the right wrist (30092.x9). A number of beads were also found in the neck area (30092.x2-6, x10 and x11), near the wooden bowl, probably the remnants of a necklace. It is possible that beads from 30092.x7 have collapsed from the upper limb (humerus) or were around the right wrist.

F.7987, Sk (32321), Cut (NO CUT ASSIGNED), Fill (32320)

F.7987 represents the very poorly preserved and incomplete neonate skeleton located in the south central region of B.131 just below the floor surface. The orientation of the skeleton could not be determined. Possible traces of phytolith cordage and orange staining below the skeleton may be from a hide wrapping or other organic material. There was no trace of cut a visible, likely because the individual was placed within the infill/makeup layer at the time of the construction of the platform/floor surface. Apart from the organic material mentioned, no artifacts were found in association with this burial.

Building 132

F.7738, Sk (32043), Cut (32037), Fill (32036)

F.7738 is a primary undisturbed burial of an infant situated within the northeast platform F.7733. The body was placed on its right side in a flexed position with the cephalic extremity oriented to the north (Fig. 9). The cut of this burial was circular and undercut. There was a basket on the western edge of the cut, so it may be that this burial cut an earlier inhumation. No artifacts were found in association with this burial.

F.7739, Sk (32045), Cut (32039), Fill (32040)

F.7739 was located in the central part of the east platform F.7734 and contained a poorly preserved primary undisturbed skeleton of a child Sk (32045). The body was placed in a flexed position on its left side with the cephalic extremity oriented towards the west (Fig. 10). There were some signs of a distinctive funerary treatment in this burial. The inhumation was preceded by lining the base of the grave cut with organic material, perhaps a hide or mat which was additionally painted or stamped in red pigment. The coating was identified by the continuous layer of white residue around the edges of the cut and patches of red pigment. Furthermore, a white residue (possibly phytoliths) covering the bones may indicate the body had been wrapped prior to inhumation, which resulted in the skeletal elements occupying a restrictive space, a clear "wall effect". While the skeleton was complete, most of the bones were highly fragmented. On the cranium there were sporadic patches of a white, plaster-like residue that appears different in composition than that of the white material observed elsewhere on the skeleton. Additionally, there was red pigment observed on the aforementioned plaster. No artifacts were found in association with this burial.

The soil of burial fill (32040.s12) had an alkaline pH of 7.57 with a conductivity of 10.43mS (Munsell color 10YR 5/3 brown). A second sample of the burial fill (32040.s13) had an alkaline pH of 7.58 with a conductivity of 7.704mS (Munsell color 10YR 5/3 brown).



Figure 9. Burial F.7738, Sk (32043) in B.132 (photo by Jason Quinlan).



Figure 10. Burial F.7739, Sk (32045) in B.132 (photo by Jason Quinlan).



Figure 11. Burial F.7748, Sk (32097) in B.132.

F.7748, Sk (32097), Cut (32091), Fill (32092)

F.7748 is a burial in the northwestern part of the building containing a tightly flexed infant with the upper limbs flexed beneath the lower limbs, such that the hands would have been placed beneath the feet, which were located to the north of the grave cut (Fig. 11). The cranium was encountered uppermost, so the body was upright in a seated position, leaning to the left, which permitted the left ribs to descend inferiorly into a space created by the decomposition of body tissues. This burial was truncated at the southwest edge by later inhumation F.7738. No artifacts were found in association with this burial.

South Area Neolithic burials

Space 565

F.8008, Sk (31615), Cut (31601), Fill (31602)

F.8008 is the tightly flexed burial of a child lying on its left side with the cephalic extremity to the northwest and the feet to the southeast. The left upper limb was extended, while the right was tightly flexed. Close to the right *os coxae* were traces of an orange organic material. No artifacts were found in association with this burial.



Figure 12. Burial F.8008, Sk (31615) in Sp.565 (photo by Jason Quinlan).

Building 17

F.8015, Sk (21817), Cut (21811), Fill (21810)

F.8015 is a primary burial of a middle adult possible female placed in a loosely flexed position on its left side with the cephalic extremity to the west (Fig. 13). The bones were very friable. A red pigment, possibly ochre, was found coating the skeleton, especially thick around the cephalic extremity. The pelvic region and torso were also covered by a thin pink-white layer of unknown material (perhaps painted plaster?). Traces of phytolith -probably from basket/matting- were found around and underneath the torso. Water laid sediment was found within the cranial vault, but nowhere else in the grave itself. This suggests that the body must have been partially skeletonized before interment in B.17- at least enough to allow water and silt to enter the cranial vault. Perhaps the body had been kept outside for a period and rainwater entered it? This potentially provides further evidence for delayed burial practices at Çatalhöyük. No artifacts were found in association with this burial.

Two soil samples from the burial fill (21810) were subjected to pH analysis (21810.s4 and 21810.s5) and showed to be alkaline. Sample 21810.s4 and 21810.s5 had a pH of 8.65 with a conductivity of 262.3 μS (Munsell color 7.5YR 4/2, brown) and S5 had a pH of 8.53 with conductivity 260.7 μS (Munsell color 7.5YR 3/2, dark brown).



Figure 13. Burial F.8015, Sk (21817) in B.17.

F.8017, Sk (21841), Cut (21815), Fill (21814)

F.8017 contained the extremely fragmented primary skeleton of a subadult located in the north-western area of Space 170. The individual was lying on its right side, with the cranium facing west and the lower limbs flexed (Fig. 14). A high concentration of phytoliths was found over the bones that are most likely a wrapping that originally surrounded the body. No artifacts were found in association with this burial.

In an attempt to explain why the remains were so highly fragmented, two soil samples from the burial fill (21814) were subjected to pH analysis (21814.s5 and 21814.s7) in order to be compared to well-preserved remains Sk (21848) in the same building. Sample 21814.5 had a pH of 8.68 with a conductivity of 227.1 μS (Munsell color 10YR 4/2, dark greyish brown) and 21814.s7 had a pH of 8.62 with conductivity 243.8 μS (Munsell color 10YR 4/1, dark grey). Clearly, this is an alkaline pH, very similar to soil from the burial of Sk (21848). As such, other factors are likely responsible for the variable preservation states of these neighboring burials.



Figure 14. Burial F.8017, Sk (21841) in B.17.

F.8019, Sk (21848), Cut (21822), Fill (21821)

F.8019 is the primary disturbed burial of an adult possible female located on the southwestern side of Space 170, along the western wall F.566. The body was placed on its right side in a tightly flexed position with the cephalic extremity to the west (Fig. 15). A small concentration of phytoliths was noted above the forearm only. The body appears to have been partially decomposed or stripped of flesh given the tight flexion and compression of the skeleton; the clavicae were oriented vertically. The bones of the hands and feet were found scattered within the burial fill.

The cranium was missing, most likely because the western side of F.8019, where the cephalic extremity was located, was cut by a post-retrieval pit (5013). A cranium recovered in 1999 from a post-retrieval pit located at the northern end of western wall F.566 appears to belong to this individual, as loose maxillary teeth found in the fill of F.8019 fit perfectly within the alveoli of the cranium Sk (5022). No artifacts were found in association with this burial. The soil of burial fill (21821) had an alkaline pH of 8.63 with a conductivity of 217.5 μ S (Munsell color 7.5YR 4/1 dark grey).



Figure 15. Burial F.8019, Sk (21848) in B.17.



Figure 16. Burial F.8027, Sk (21856, 21858) in B.17 (photo by Jason Quinlan).

F.8027, Sk (21856, 21858), Cut (21857), Fill (21852)

F.8027 is a primary double burial containing an adult female Sk (21856) and a child Sk (21858). The adult female was placed in a loosely flexed position on its left side with her the cephalic extremity to the north (Fig. 16). The skeleton of the adult female was only partially articulated, suggesting that the individual was deposited in a partially fleshed state.

The child Sk (21858) was placed in a flexed position on its right side, above the left shoulder region of the adult female Sk (21856) such that the cranium of the child was in contact with the cranium of the adult female. While the preservation of the bones of child Sk (21858) is poor, it is still possible to observe that the skeleton is

largely articulated. This suggests that, in contrast to Sk (21856), the corpse was interred in a fully fleshed state. No artifacts were found in association with this burial.

F.8214, Sk (21855), Cut (21854), Fill (21853)

F.8214 is a primary burial of a child placed in a flexed position on its right side, with the cephalic extremity to the north, facing down. It was located along the western wall (F.566) of Space 170, directly northwest of burial F.8018. The skeleton was only partially articulated. The lower limbs, including the feet, seem to be in perfect articulation, but the upper torso is partially disarticulated. The clavicae and left scapula were found in the lower abdominal area; a few ribs were also found in a disarticulated state, while the cephalic extremity had been completely rotated. Some traces of red pigment were found close to the body and underneath it, especially under the torso and left upper limb. No artifacts were found in association with this burial. The grave cut for F.8214 appears to be dug into the western end of an earlier grave (F.8018), which was not fully excavated in 2016.



Figure 17. Burial F.8214, Sk (21855) in B.17.

Building 80

F.7417, Sk (19169), Cut (19141), Fill (19140)

F.7417 is the primary burial of a middle adult male located in the central floor of B.80, immediately south of northwest platform F.3442. The body was placed in a tightly flexed position on its left side with the cephalic extremity to the west (Fig. 18). This is the only burial in B.80 that was not cut into one of the platforms, possibly because of a lack of space. No artifacts were found in association with this burial.



Figure 18. Burial F.7417, Sk (19169) in B.80 (photo by Jason Quinlan).

Northwest platform F.3442

F.7418, Sk (19151, 19152), Cut (19143), Fill (19142)

F.7418 is a primary disturbed double burial under platform F.3442 containing a mature adult possible female Sk (19151) and a young adult female Sk (19152). Both individuals were placed on their left sides in tightly flexed positions with their crania to the west and facing north (Fig. 19). Sk (19151) was placed at the southern end of the grave cut, and Sk (19152) at the northern end. Sk (19151) was placed in the grave first, as the right upper limb of Sk (19151) was extended underneath the cervical vertebrae (neck) of Sk (19152). In addition, the right and left knees of Sk (19151) were located underneath the rib cage and pelvis of the Sk (19152). Burial F.7418 was slightly truncated at the eastern edge of the grave cut by later interment F.7400 (excavated in 2013), resulting in the dislocation of the foot bones of Sk (19151). The tight flexion of the skeleton suggests that the body had been wrapped or bound in some way.



Figure 19. Burial F.7418, Sk (19151) (top) and Sk (19152) (bottom) in B.80 (photo by Jason Quinlan).

While removing the right *os coxae* of Sk (19152) a worked bone pin (19152.x1) was found against the last two lumbar vertebrae and the sacrum in between the two *ossa coxae* (i.e. in the mid-line area of the pelvis). In addition, a second worked bone pin (19151.x2) was found against the edge of the grave cut, near the pelvic girdle area of Sk (19151). This pin might have been used for holding a shroud or other body wrapping. Both pins (19152.x1 and x2) turned out to be separate halves of the same ovicaprid metapodial, but 19151.x1 shows sharpening and polishing suggestive of extensive use, while 19151.x2 appears unfinished. 19151.x1 is a fragment of black pottery discovered beneath the cervical vertebrae. In addition, an obsidian micro-core (19152.x2) was discovered over the left *os coxae*. Lastly, a shell fragment (19152.x3) was located against the left ankle.

F.7420, Sk (19159, 19166), Cut (19158), Fill (19157)

F.7420 is the primary disturbed double burial under the northwest platform (F.3442) containing the tightly flexed skeletons of an adolescent Sk (19159) and a child Sk (19166). Both individuals were placed in flexed positions on their left sides (Fig. 20), with both cephalic extremities oriented to the southwest. Sk (19166) was placed on top of the inferior portion of the left upper limb of Sk (19159).

As with F.7418, grave F.7420 was truncated at the southwestern edge of the grave cut by later burial F.7400 (the last interment in platform F.3342). This truncation dislodged the cranium, left hand, right upper limb and scapula of Sk (19166). These skeletal elements were found in the grave fill of F.7400 when it was excavated in 2013. The right upper limb was still articulated, suggesting that this individual was disturbed shortly after burial. No artifacts were found in association with this burial.



Figure 20. Burial F.7420, Sk (19159) (bottom) and partially removed Sk (19166) (top) in B.80 (photo by Jason Quinlan).



Figure 21. Primary burial F.7419 in B.80, Sk (19148), and loose cranium Sk (19154) in upper right corner (photo by Jason Quinlan).

Northeast platform F.3441

F.7419, primary Sk (19148), primary disturbed Sk (19154), Cut (19149), Fill (19147)

Burial F.7419 was partially exposed in 2014 during the excavation of F.7404, a later burial that truncated it. F.7419 was not fully excavated until this season. The grave cut contained the skeleton of a child Sk (19148) placed in a tightly flexed prone position such that the limbs were tightly flexed underneath the body. The cephalic extremity was oriented to the south (Fig. 21). Burial F.7419 disturbed earlier burial F.7427, which contained Sk (21732) (see below), whose cranium and mandible, assigned as Sk (19154), were dislodged and re-deposited in the grave fill (19147). No artifacts were found in association with this burial.

F.7422, Sk (19165), Cut (19162), Fill (19161)

F.7422 is the primary undisturbed burial of an adolescent interred in a flexed position on its left side with the cephalic extremity oriented to the west and facing down (Fig. 22). The upper limbs were flexed and placed between the lower limbs. There is no indication of subsequent disturbance of the skeleton itself, but later burial F.7404 just truncates the eastern edge of the grave cut (19162). No artifacts were found in association with this burial.



Figure 22. Burial F.7422, Sk (19165) in B.80 (photo by Jason Quinlan).

F.7427, Sk (21732), Cut (21215), Fill (21214)

F.7427 is the primary disturbed interment of a middle adult possible male. The body was placed in a flexed, nearly supine position, slightly on its right side with the cephalic extremity oriented to the east (Fig. 23). The cranium and mandible of this individual (assigned as Sk (19154)) was recovered from the grave fill of subsequent burial (F.7419), which was placed above the upper thorax of Sk (21732). The sacrum, left *os coxae*, left femur, tibia, fibula, talus and calcaneus were missing; they were likely removed during the interment of later burial F.7404. No artifacts were found in association with this burial.



Figure 23. Burial F.7427, Sk (21732) in B.80 (photo by Jason Quinlan).

Building 160

F.7821, Sk (32618), Cut (22397), Fill (22396)

F.7821 is the primary undisturbed burial of a middle adult male located under the eastern platform (F.7820) of Space 551 (Fig. 24). The body was placed in a flexed position on its right side with the cephalic extremity oriented to the east. Phytoliths were found in the vicinity of the cephalic extremity. No artifacts were found in association with this burial.

F.7828, Sk (32437), Cut (32448), Fill (32403)

F.7828 is the primary undisturbed burial of an older adult male located in the western part of Space 551. The body was placed on its right side in a flexed position with the cephalic extremity oriented to the west (Fig. 25). The eastern edge of the grave cut (32448) appears to have intersected an earlier burial, exposing the cephalic extremity (see F.7848 below).

A wooden plank (32403.x1) partially covered the skeleton, running from the left shoulder to the left *os coxae*. The soil directly above the region of the upper thorax was stained with a red pigment (likely ochre); however, the bones themselves did not show any evidence of pigment staining. No other artifacts were found in association with this individual. Basic soil analysis indicates an alkaline pH of 8.89 and conductivity of 220.2 μS (Munsell color 10YR 5/3, brown).



Figure 24. Burial F.7421, Sk (32618) in B.160 (photo by Jason Quinlan).



Figure 25. Burial F.7828, Sk (32437) in B.160. Child cranium Sk (32447) of burial F.7848 can be seen on the right (photo by Jason Quinlan).

F.7848, Sk (32447), Cut (32609), Fill (32607)

F7848 contained the primary disturbed skeleton of a child located immediately east of F.7828. The body had been placed in a flexed position on its left side, with the cephalic extremity oriented to the south (Fig. 25). With the exception of the left forearm, left hand, and both fibulae and feet, the skeleton was complete and in anatomical connection. This burial was truncated by the grave cut of subsequent burial F.7828 (see above) in the region of the cephalic extremity, although the cranium and mandible were not disarticulated from the infracranial skeleton. No other artifacts were found in association with this individual.



Figure 26. Burial F.7848, Sk (32608) in B.161 (photo by Jason Quinlan).

Building 161

F.7849, Sk (32608), Cut (NO CUT ASSIGNED), Fill (32611)

F.7849 is the primary burial of a young adult male placed directly between room fill layers during the post-occupation infilling of Building 161 (no cut was visible). As such, it is not a typical subfloor Neolithic burial interred during the occupation phase of a building. It is also unusual because of the orientation of the skeleton: it appears to have been thrown in with the building infill, such that the body was oriented in a loosely flexed, prone position (slightly on the left side) with the cephalic extremity to the north and the feet to the south following the inclination of the infill layer below it (Fig. 26). In addition, there are possible signs of constraint due to the extreme adduction of the right humerus and medial rotation of the shoulder. The cranium clearly abutted the partition wall F.8159, so it seems clear that the body was not properly buried, just deposited seemingly without care. Since no cut was visible, an arbitrary fill unit (32611) around the body was assigned. Phytoliths in a cross weave pattern were found near the cranium and below the body, possibly indicating a mat or other type of covering. A mandibular left 3rd molar was also found between the right ribs and the left scaphoid was found near the acromion of the left scapula – perhaps an indication of the disarticulation of a delayed burial. No other artifacts were found in association with this individual.

Another unusual observation was the presence of a thick layer of microfauna found in association with the skeleton. A nearly identical case of microfauna in association with a burial was observed in burial F.513 Sk (4615) in adjacent Building 6 during excavations in 1999. The soil of burial fill (32611.s5) had an alkaline pH of 8.75 with a conductivity of 173.3 μ S (Munsell color 10YR 4/2 dark greyish brown).

North Area Post-Chalcolithic burials

Space 85

F.5077, Sk (32104), Cut (32103), Fill (32102)

F.5077 is a Roman primary burial containing the skeleton of a middle adult female. The body was placed in a supine position with the cephalic extremity to the west and the feet to the east (Fig. 27). The position of the skeletal remains, traces of wood, and iron nails indicate the body had been placed in a rectangular wooden coffin. The grave was cut into Neolithic external Space 85. The soil of burial fill (32102.s9) had an alkaline pH of 7.47 with a conductivity of 8.048 mS (Munsell color 7.5YR 3/2 dark brown). A reddish-pink pigment observable on the second thoracic vertebra and left gonial angle of the mandible could potentially be staining from a draped cerecloth. The color is reminiscent of cinnabar but could also be ochre.



Figure 27. Burial F.5077, Sk (32104) in Sp.85 (photo by Jason Quinlan).

This skeleton was disturbed and damaged by animal burrowing activity, such that many elements are missing. The fill of the burial was highly disturbed as well, containing a large number of loose adult and juvenile human bones, along with a mix of Neolithic and later materials.

The following artifacts were associated with this burial: 32102.x1: stone pendant; 32102.x2: glass unguentarium; 32102.x3: glass tear jar; 32102.x4: ceramic unguentarium; 32102.x5: broken ceramic unguentarium; 32102.x6: copper alloy box hasp; 32102.x7: iron fibula brooch; 32102.x8: broken glass bottle; 32102.x9: milled rectangular copper alloy plate; 32102.x10: left gold earring; 32102.x11: right gold earring; 32102.x12: textile (shroud?); 32102.x13: mineralized coffin wood; 32102.x14: copper alloy ear scoop; 32102.x15: glass melon bead. A second melon bead was recovered from the grave fill but not given an x-find number, and a thin sheet of wood preserved directly behind the milled copper alloy plate 32104.x10 was also recovered.

Research projects

In terms of research, a number of ongoing and newly initiated study projects were carried out. Marco Milella and Christopher Knüsel started a project on humeral bilateral asymmetry, joining osteometric measurements of especially the distal end and enthesal developments of the medial and lateral collateral ligaments of the elbow. This project builds on the enthesal work done in conjunction with Josh Sadvari and the lithics laboratory, which was published in the *Assembling Çatalhöyük* volume. By the same token, Bonnie Glencross and Christopher Knüsel prepared two published research papers in conjunction with the IMITATIO research group, one in conjunction with Marco Milella, based on their ongoing analysis of cranial trauma at the site. This work is planned for completion next year. Two other research papers were completed and submitted for peer review, one on the Space 77 (North Area) cranial retrieval (Haddow and Knüsel) and a second on Sk (3368), the sole adult found deposited in a midden at the site (Milella, Knüsel and Haddow). Further aDNA sampling was completed to support the joint Middle Eastern Technical University (METU) project collaboration with Mehmet Somel and colleagues and a separate, but ultimately linked doctoral project with Maciej Chyleński (Poznan University). The HR team also completed further sampling of human remains to support Alex Bayliss' (Historic England) Bayesian-based dating of the site. Evan Garofalo collected data on limb bone cross-sections for a study on mobility of the population at the site. Jessica Pearson completed sampling of teeth for stable light isotope analyses of diet and radiogenic strontium ($^{87}\text{Sr}/^{86}\text{Sr}$), sulfur and oxygen isotope analyses for studying migration/residential mobility. In addition to continuing his research on secondary and tertiary burial deposits, Scott Haddow also collected femoral cortical bone samples for a histological analysis of bone bioerosion and crystallinity measurements for Haddow, Schotsmans and Knüsel's IdEx project on delayed burial. Eline Schotsmans continued sampling grave constituents to achieve a better understanding of the preparation of the body for burial, the construction of the grave, and the decomposition process of the corpse. She also revisited carbonized brains, triggered by the findings of brain in Building 131, which could lead to a small side project. Sophie Moore continued her funerary spatial analysis and work on the small finds from the post-Chalcolithic (Roman and medieval) burials found in the uppermost layers across the excavated area. Finally, Barbara Betz continued her dental casting of anterior teeth as part of her doctoral research on dental stress indicators.

On-site soil analysis

To obtain a general idea of the soil conditions, basic soil analysis was carried out (pH and conductivity) of 17 soil samples from burials in the North Area (N=10) and the South Area (N=7). Bone preservation is related to overlapping reactions from the depositional environment such as water, acidity, oxygen in the soil, but also by sociocultural factors such as the way the body was buried or what happened to the body between death and burial.

The results show a pH between 7.31 and 8.02 in the North Area and between pH 8.53 and 8.89 in the South Area (for the individual measurements see text below). This means that the soil in both shelters is neutral to alkaline. In general, bone preservation is best in soils with a neutral or slightly alkaline pH and worse in acid conditions. This means that, theoretically, the human remains in Çatalhöyük should be well preserved. Unfortunately, we see variation in preservation at Çatalhöyük ranging from a high degree of fragmentation to qualitatively badly preserved bones. It is clear that degradation and preservation mechanisms are complex. It could well be that sociocultural factors played an important role. What happens between death and burial? And what is the

importance of the location of the burials with perhaps some of the skeletal remains being trampled upon more often than others?

An additional natural factor that has an influence on bone preservation is the presence of so-called “white salts” on the bones (as it is generally called by the excavators at Çatalhöyük). This white material was identified as lenticular gypsum with X-ray diffraction and Scanning Electron Microscopy (SEM) (Fig. 28). The formation of lenticular gypsum is often observed in arid and semi-arid environments in gypsum rich soils. They appear most frequently in a pH neutral to basic soil. Both the presence of gypsum ($\text{CaSO}_4 \cdot 2\text{H}_2\text{O}$) and alkaline pH measurements have now been confirmed at Çatalhöyük. Bone is one of the host materials for the formation of lenticular gypsum because it is calcium rich. Eventually the gypsum becomes embedded in the bone and can lead to its destruction.

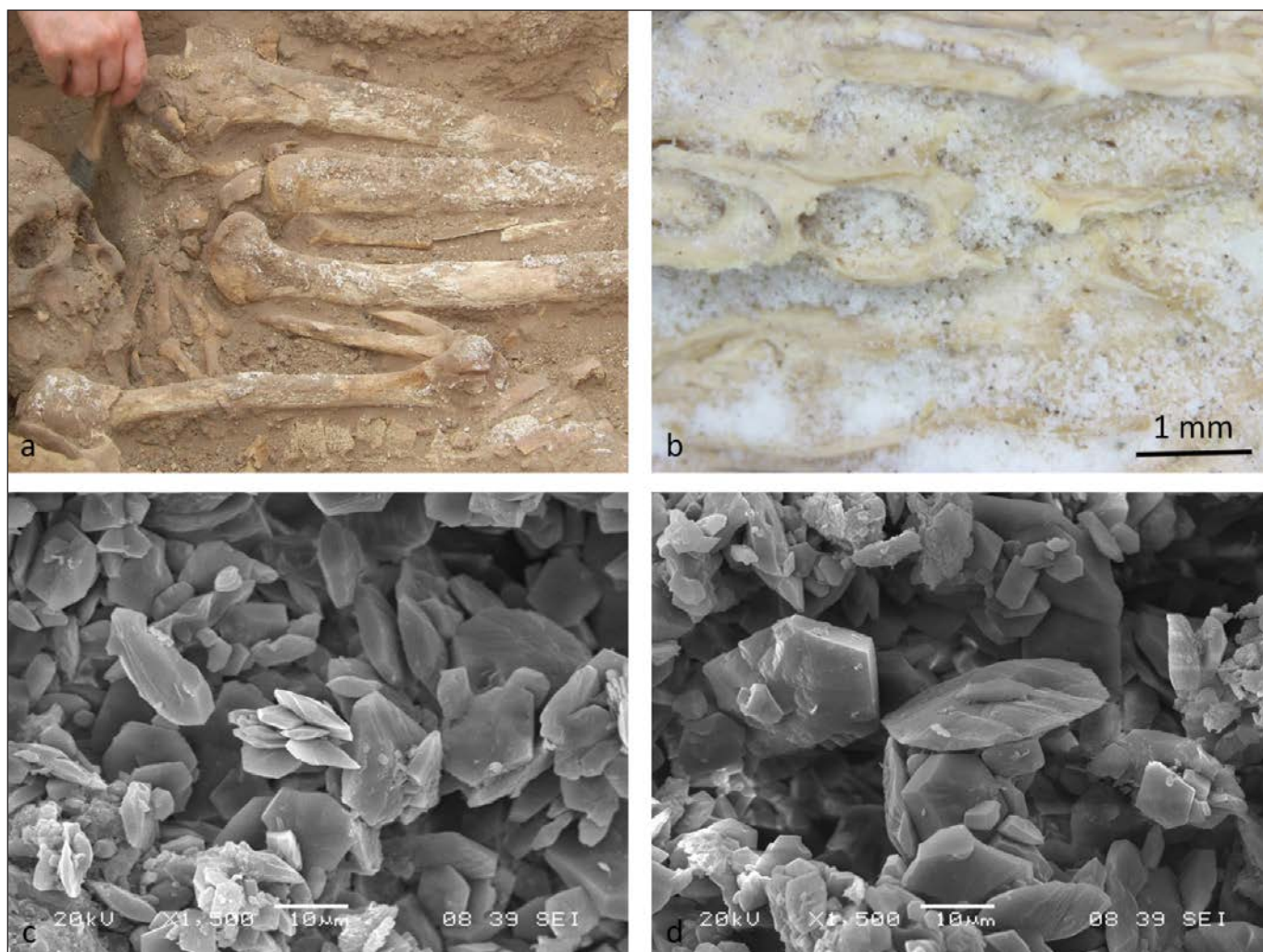


Figure 28. (a) Lenticular gypsum, so called “white salts”, present on the skeletal remains of Sk (20601) (Sp.77, North Area), excavated in 2012 (photo by Christopher Knüsel); (b) a detail of lenticular gypsum on trabecular bone (photo by Eline Schotsmans); (c) and (d) SEM images of lenticular gypsum from Catalhöyük, clearly showing the lenticular morphology of the crystals (Photos by Eline Schotsmans).

This naturally formed gypsum is more often observed in the North Area than in the South Area, again confirmed by the conductivity results. The measurement of conductivity is directly related to the concentration of ions from dissolved salts and inorganic material in the soil. While the North Area showed conductivity between 4 and 14 mS, the South Area had a conductivity between

173 μS and 262 μS . Clearly, there are more salts present in the soil of the North Area and this may be due to differences (e.g. humidity, temperature) between the micro-environments created within the North and South Area excavation shelters. Gypsum ($\text{CaSO}_4 \cdot 2\text{H}_2\text{O}$) is one of those soluble salts causing the formation of lenticular gypsum on the skeletal material and elsewhere.

Chapter 6

Faunal Remains from the North and South Areas

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Introduction

In 2016, fauna from the main excavation areas (North and South) and the GDN Area were analyzed and reported on by Wolfhagen and Demiregi, although for most of the season only Wolfhagen was present. The TPC excavations were recorded and reported on by Albesso and Daujat (see Chapter 7). No West Mound fauna were analyzed this year.

North and South Area

The goals of the faunal analysis for the North and South Areas in 2016 were to:

1. Analyze material from the current excavations, particularly contexts assigned as priority units
2. Assist visiting isotopic specialists in identifying and locating suitable material for analysis (stable carbon, nitrogen, and sulfur; %nitrogen and radiocarbon)
3. Complete the recording of priority units from previous excavation seasons

Results

Over 25,000 North and South Area fragments were analyzed during the 2016 season. This resulted in a zone-based NISP of 1,414 specimens from the North and South Areas. The York Zone recording system was employed as a measure of bone completeness; the average completeness of specimens with zones was 2.9 zones/specimen. The team has been recording North and South Area York Zones since 2012. Table 1 presents a comparison of bone completeness over the past five years for specimens with a minimum of one zone present. There are no clear trends from season to season visible. Completeness is higher in the 2013 and 2014 seasons, but we are confident that that is primarily because faunal goals for those seasons focused on assessing as many units as possible. Assessment-level recording favors relatively complete (and thus taxonomically identifiable) specimens (Archive Report 2013, 2014). This same trend is clear in the GDN Area faunal records, which until now have been dominated by a cache of astragali (see Archive Report 2015). Material analyzed under assessment-level recording will not be used to determine taxonomic abundance claims, but is valuable for recording as many measurable specimens as possible. Results suggest that there is no major difference in the completeness of bones between the North and South Areas.

The species composition of taxonomically identifiable faunal material analyzed in 2016 is presented in Table 2 (quantified using NISP). As is typical for Çatalhöyük, the material was dominated by sheep/goat (primarily sheep) remains. The NISP totals for the South Area are anomalous due to the recovery of a nearly complete felid skeleton in a foundation pit in the annex of B.160 (32496). Excluding this (removing the “Other” category) from the South Area data increases the proportion of sheep/goat specimens to around 60%.

Year	Overall		North		South		GDN	
	Avg Zones	Count	Avg Zones	Count	Avg Zones	Count	Avg Zones	Count
2012	2.7	2672	2.9	239	2.7	2433		
2013	3.8	293	4.4	10	3.8	283		
2014	3.9	981	3.6	227	4.0	754		
2015	2.4	1522	2.9	167	2.3	1355	7.5	212
2016	2.9	1414	2.8	508	2.9	906	4.2	136

Table 1. Comparison of York Zone completeness by area for recorded material, 2012-2016.

Taxon	South	North	GDN	Total
Ovis/Capra	651	493	124	1268
Bos	297	77	15	389
Sus	32	10	1	43
Cervid	16	16	2	34
Equid	46	42	11	99
Other	136	14	1	151
Ovis	115	65	61	241
Capra	11	8	9	28
Total	1178	652	154	1984
% Caprine	55	76	81	64
% Bos	25	12	10	20
% Other	45	24	19	36

Table 2. Taxonomic composition (NISP) of 2016 recorded material for the main project.

Isotopic sample identification

The faunal laboratory staff identified appropriate material for Dr. Jessica Pearson's (University of Liverpool, UK) and Dr. Alex Bayliss' (University of Stirling, UK) analyses of stable carbon, nitrogen, and sulfur isotopes (Pearson) and %nitrogen and AMS radiocarbon analysis (Bayliss). Where possible specimens that provided supplementary data in addition to taxonomic data were selected; in particular specimens with metrical data that could be employed to determine the sex and age of the sampled individual were targeted.

Dr. Pearson sampled 176 faunal specimens from the East Mound (North and South Areas). The majority of these (118) were *Bos* specimens with metrical data, facilitating the identification of dietary status differences between wild aurochs (*Bos primigenius*) and domesticated cattle (*Bos taurus*).

Dr. Bayliss sampled across the entire East Mound (North, South, TP, TPC and GDN Areas) for %nitrogen and AMS radiocarbon analysis. The 115 faunal samples selected derived from material found in articulation or with refitting unfused epiphyses. Restricting radiocarbon samples to bone that fall into those two categories ensures that the material is securely associated with the deposition of the contexts being dated (Bayliss *et al.* 2013: 74-75).

Priority units

In September 2016, the faunal remains team reassessed and updated progress on recording units designated as ‘priority’ during excavations. Since 2009, 65% of all priority units have been fully recorded (as ‘T1 Recording’). An additional 25% have been recorded as ‘2014 Protocol’ to assess the frequency of rarer taxa (i.e. recording mostly focused on taxa other than caprines). A further 8% of all priority units have only been subject to partial recording with 2% of material entirely unexamined. Priority units only partly recorded were considered to provide only insignificant faunal information. Their entry into the database has typically consisted of recording the x-finds and writing a faunal description of the unit. However, two of these units, namely (20627) and (20965), have since been reassessed as having significant research value and will be recorded fully in the next season.

Future goals

The first goal for future research is to complete the study of units and sequences that have been selected for inclusion in the radiocarbon dating program. This will provide a clear framework for examining chronological changes within the fauna data.

A second key aim is the continuation of the analysis of Spaces 85 and 610 in the North Area and Buildings 161 and 17 in the South Area. These areas produced significant cultural material in 2016.

A third aim is to focus on key groups of special finds, in particular the large groups of bovine skulls, horncores and scapulae recovered from the North Area excavations over the past few excavation seasons. This will include a detailed analysis of the North Area contexts within which these items were recovered. Analysis of the faunal material will build on previous research on bone clusters associated with feasting from the South Area (Demirergi 2015) and examine the relative abundance of cranial vs post-cranial remains to explore the use of cattle crania in the North Area.

A final goal is to collaborate with Dominik Lukas to translate faunal records from the older system (recorded through 2011 using the faunal “Long Form”) into the more recent recording system (“Tier 1” recording; 2012-present). A description of the variation between the two systems is included in the 2012 Çatalhöyük Archive Report; the major differences relate to whether a specimen merits an individual record and how to record the completeness of a specimen and its portion(s) present. Currently, the faunal team can broadly translate between the two systems to analyze aspects of bone completeness, but to do this more systematically the double-recording of some contexts with both the Long Form and Tier 1 systems will be undertaken. This double-recording will deliver a stronger sense of how to translate between the two systems and provide the Database Manager with appropriate data to support methodologies for ensuring the two systems are fully comparable.

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Chapter 7

Faunal Remains from the TPC Area

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Introduction

During the season 2016, the analysis of faunal remains from the TPC Area (project sponsored by the Polish National Science Centre; decision DEC-2012/06/M/H3/00286) was focused on material excavated in 2015. The animal bones come from selected secure Neolithic contexts, the prioritised period, as this was the case in previous years.

While the majority of the time was spent identifying the animal bones, additional time was devoted to the selection of sheep (*Ovis*) teeth from contexts excavated in 2015 and 2016 for further isotope analyses (Dr. Jessica Pearson, University of Liverpool). In total, 39 molars (lower M1s and M3s) were selected from nine different contexts. Of course, the research objectives still remain the same (for a detailed account see Archive Report 2014).

The TPC Area Neolithic fauna

This season a total of 3,216 remains were studied, amongst which 1,303 could be identified at different levels (mostly to genus, plus a few precise species), so 40.5% of the total NISP. The remaining 1,913 could not be identified. This additional material raises the total of mammal bones studied for the TPC Area to data to 8,619 (25.5% identified/75.5% indeterminate, Table 1).

TPC Area	NISP	%
# indeterminate species	6424	76
# determined species	2195	26
NISP mammal total	8628	-

Table 1. TPC Area faunal material recorded to date.

This relatively high proportion of unidentified bones is due to the quite important fragmentation of the material. While some fragmentation was probably due to human or carnivores/omnivores activity, especially material from midden deposits (primary deposit as a result of consumption), it does not seem to have been the main cause for breakage. Indeed, most of the

fragmentation seem to be explained by the nature of the archaeological contexts, in majority room infills, which are very often composed of re-deposited material from different sources and events.

Bones have been very little affected by post-depositional taphonomic agents (i.e. root-etching, physical and chemical actions, etc.). Very few bones shows root-etching marks and only one fragment presents dissolution marks, probably due to water movement and the acidity of the soil. This quasi-absence of post-depositional taphonomic processes, except for gnawing mark, shows that the bones were buried relatively soon after consumption. However, those bones were accessible to carnivores at some point.

All of those processes will be properly quantified and analysed in order to establish the taphonomic history of the assemblage and to compare between different contexts, once the study is completed.

The material studied this season comes from 21 contexts (12 room infills, 6 midden deposits, 2 pit infills and 1 floor), belonging to nine different spaces: Sp.496 (22749), Sp.517 (30830), Sp.533 (21022), Sp.562 ((31332), (31363)), Sp.578 ((31326), (31352), (31361), (31367), (31802), (31827)), Sp.584 ((21039), (31824)), Sp.589 ((31396), (31812)), Sp.596 (31848), Sp.597 ((21038), (31832), (31850), (31854)). The majority of bones come from Sp.578 and Sp.597 with respectively 1,198 and 1,291 identified remains.

TPC Area	NISP	% NISP
<i>Ovis/Capra</i>	828	63.5
<i>Ovis</i>	214	16.4
<i>Capra</i>	22	1.7
<i>Bos</i> sp. (cf. <i>taurus</i>)	195	15
<i>Equus</i> sp.	12	0.9
Cervids	3	0.2
<i>Sus</i> sp.	16	1.2
<i>Canis</i> sp.	8	0.6
<i>Vulpes vulpes</i>	4	0.3
<i>Lepus europaeus</i>	1	0.1
Total	1303	

Table 2. Relative proportion of taxa in TPC Area to date.

The mammal spectrum is not very diversified as previously seen (Table 2; see Archive Report 2013, 2014, 2015), with caprines (*Ovis/Capra*) being dominant (81.1% of identified NISP). Those remains are difficult to assign precisely to sheep or goat due to the high fragmentation. Moreover, articular surfaces – parts that allow species identification, are too often absent or badly preserved.

Amongst caprines, sheep (*Ovis*) represent 16.3% of the total NISP of identified bones, whereas goats are very scarce with only 22 bones (less than 2% of the identified NISP).

Cattle (*Bos*) bones are the second most represented taxa (15% of the identified NISP). Bones are sometimes complete or sub-complete, especially coming from lower limbs (metacarpal, metatarsal, phalanges), but also cranial part such as a frontal from a young individual (Fig. 1).



Figure 1. Frontal view of a young cattle skull from Sp.533 (21022).

Other large/medium mammals were also identified. Suids (*Sus* sp.) represents only 1.2%. Unfortunately, it is not possible to tell if they were from wild or domestic animals due to their poor preservation. Equids are relatively scarce (0.9% of the identified NISP), of which a lower molar (M2) belong to a horse (*Equus caballus*). Finally, cervids were only represented by three bones, one of which is a piece of antler from a red deer (*Cervus elaphus*).

The carnivores are also attested, either by their bones, such as dog (*Canis familiaris*, 0.6%) and fox (*Vulpes vulpes*, 0.3%) or the gnawing/teeth mark on other animal bones (Fig. 2). In any case, their presence remains quite low.

Finally, one bone of hare (*Lepus europaeus*) was found as well as a few bird bones. Birds as well as micromammal, fish, amphibians and reptiles are not yet counted in the total NISP, but will be in the future upon specific identification.

Despite the relatively poor preservation (see above) of the animal remains from TPC Area, these preliminary results are nonetheless important and confirm the already observed trends as seen in previous years, i.e. a subsistence based mainly on caprines.



Figure 2. Proximal extremities of caprine radii bearing gnawing marks from Sp.578 (31361).

Chapter 8

Macro- and Micro-Botanical Remains

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Introduction

This report describes the archaeobotanical work carried out at the site over the 2.5 month field season and summarizes preliminary results for flotation samples processed in 2016. Archaeobotanical information for archaeological contexts of special interest (i.e. priority units) is also presented, as well as results from initial analysis of some archaeobotanically interesting units.

Archaeobotanical sampling

The archaeobotanical sampling procedure was revised and summarized for the (new) excavators as follows:

- Samples should be taken from every excavation unit. If within a unit different layers/soil types/concentrations of material(s) occur, separate samples can be taken to account for the variation (i.e. a unit can produce multiple flotation samples).
- A sample should normally consist of 30 liters of sediment (or all of the available sediment if the unit is smaller than 30 liters). Burials (burial fills) and deposits containing visible concentrations of plant remains should always be 100% sampled (though in the latter case as multiple samples, see below).
- When excavating a wall, the 'brick' sample should consist of maximum 10 liters of sediment; the 'mortar' sample can contain 30 liters of soil.
- Samples should be taken from the center of the unit in order to avoid contamination from adjacent units. However, when charred plant remains are visible (as concentration) multiple samples should be taken – from the center and edges of concentration (the archaeobotanist should be consulted). The charred remains from visible concentrations (e.g. in burned buildings) can be collected as botanical samples, that is, the samples that do not undergo flotation but are dry-sieved.
- When excavating floors, a grid system can be used, e.g. sampling within each 1 x 1m square, in addition to taking the sample from the center (the archaeobotanist can be consulted).
- Samples from units prioritized for analysis in the field should be taken to the flotation area as soon as the excavation of these units has been completed, in order that processing is completed in time for priority tours. Other samples should also be taken to the flotation area at the end of the work hours.

Flotation

Before the season's start, the flotation tanks had been repainted, the pipes replaced and a new heavy residue mesh installed; also, the sludge outflow area had been cleared and expanded. Around 40 flotation bags remaining from last year's excavations in the TPC, GDN and North areas were

processed first. The work continued with processing of sediment from newly excavated deposits. Small samples (smaller than 1 liter) were normally processed by hand (i.e. bucket flotation). A total of 653 samples were floated during the 2016 season, amounting to c.12,943 liters of sediment; a backlog of about 90 bags remains to be processed in 2017 (see Table 1 for the number of samples per excavation area). A burial fill unit (22194) (Fl. 12693) possibly contaminated by cinnabar inclusions was floated separately, in a spare flotation tank; the water used for processing this sediment was not re-used.

Excavation area	No. of floated samples in 2016	No. of samples from priority units
North	341	83
South	205	42
TPC	89	3
GDN	17	
West Mound	1	

Table 1. Number of floated samples and samples from priority units by excavation area.

Sample scanning (preliminary analysis)

The ‘sieve-scan’ system introduced in 2015 was applied again this year (Bogaard *et al.* 2015). This is the first stage of the field laboratory analysis and involves sieving of the light fraction (flots) using 4mm, 1mm and 0.3mm sieves; measuring (volume) and scanning of the 4mm fraction for wood, tubers, nuts, hackberries, whole dung pellets etc. and recording their presence; measuring (volume) and scanning of the 1mm fraction and recording whether or not the sample resembles an activity-specific deposit (e.g. dominated by wood charcoal or a single category of material such as cereal grain, pulse, nut etc.), in contrast to the vast majority of ‘mixed’ samples, already amply documented in previous studies. In this way samples that stand out as particularly informative, whether or not they are designated as priorities, are identified very early on and are selected for more detailed analysis.

Forty-five flots left over unscanned from 2015 were processed, as were all of the flots from 2016 season. In addition to relatively numerous samples composed entirely of wood charcoal, the sieve-scan detected the sample from unit (20789) (Fl. 12972, TPC Area) dominated by charred pea seeds (most of which were retrieved from the heavy fraction of the sample). According to the excavators, the unit that yielded the ‘cache’ of peas represents a constructional element of a platform (F.8279) in the form of a (makeup) layer sitting on top of a plastered floor. It is difficult to ascertain whether the peas represent remains of an activity that took place on the floor, and/or were deliberately deposited, or if they represent a chance inclusion in the construction material (perhaps quarried from a midden).

Priority units (sub-sample study)

A total of 128 samples from 75 units declared priorities for the field analysis were assessed following the standard Level 2 archaeobotanical protocol (see details in Bogaard *et al.* 2005). The units offered a diversity of deposits including both primary (i.e. hearths, ovens, dirty floors) and secondary/tertiary (e.g. pit fills, middens) contexts (see Table 1 for the number of priority samples per excavation area). The samples from these contexts were generally dominated by cereal processing waste (mostly glume wheat glume bases) or they contained a large number of wild plant seeds

potentially deriving from burned dung (sedge and small legume seeds), whilst a vast majority included a combination of material from both of these sources. Some samples also contained remains of collected plants (mostly in the form of nutshell) and possible food preparation 'accidents' and food spills (e.g. highly distorted cereal grains and 'bread' lumps). Samples 8 and 9 from (32106) (Fl. 12538 and 12543) excavated in midden in Sp.85 (North Area), for instance, were almost entirely composed of hackberry nutlets. Unit (32111) from the same space (samples 11, 12, 14, 15; Fl. 12621, 12622, 12623, 12627) represents a fire spot; two of the samples yielded large quantities of cereal grain that appear to have been exposed to unusually high temperatures; other samples consisted mainly of dehusking waste (glume wheat glume bases) but contained possible burned food remains as well. The majority of the priority samples are of (very) low to moderate density and do not merit further consideration.

Most of the high-density samples are chiefly composed of cereal chaff/dehusking waste and indicate concentrated deposition of cereal by-products discarded in domestic fires (possibly used as 'occasional' fuel - cf. van der Veen 2007); some of these deposits derive from primary locations of *in situ* burning (e.g. an oven fill (32009) and a fire spot (32112)). Below are summary descriptions of the contents of several high-density priority units and/or units whose composition is of particular archaeobotanical interest:

Unit (20761) (Fl. 12982) is a lower, possibly intact, layer of an infill of a complete ceramic vessel found within a room fill in B.150 in the TPC Area. The top part of the pot fill was in its appearance very similar to the matrix that surrounded the pot (e.g. made up of loose reddish brown soil and containing small fragments of plaster) and is thus understood to be of secondary origin. The lower part of the infill was compact and of dark color and appeared burnt, presumably together with the pot that also showed signs of secondary burning in its lower part. A ground stone was sitting on top of the dark-color fill. The fill (of about 3 liters in volume, taken as sample 5) contained some 200 charred grains of free-threshing wheat. Along with the grain, weed seeds were also found inside the pot, most of which belong to *Teucrium*. No free-threshing wheat rachis was encountered, suggesting that the grain was stored after post-harvest winnowing/threshing and that any remaining rachis segments were destroyed in high temperatures (cf. Boardman and Jones 1990). An initial impression is that the pot was deliberately placed within the room fill, perhaps as a special (symbolic?) deposit.

Unit (22351) (Fl. 12436) is a layer within the midden in Sp.583 (South Area). According to the excavators, it consisted of general dump material including fragments of building material, animal bone, fragmented artefacts, etc. In the western part of the deposit more charred remains were visible. The high amount of likely dung-derived seeds (in particular sedge seeds and small-seeded legumes) in the sample from this unit indicates a possible (outdoor) fire spot, or at least an accumulation of spent dung fuel.

Unit (22359) (Fl. 12499) is a concentration of burnt plant material and artefacts found on a floor in B.89 (South Area); the plant material may have been charred *in situ*. In addition to abundant glume wheat glume bases, it included a similarly high number of arable weed seeds (e.g. large-seeded grasses); a few seeds likely originating from dung used as fuel were found, as were pieces of acorn kernel. The deposit may represent a discrete crop (glume wheat) processing event.

Unit (20712) (Fl. 12847) is the infill of Sp.585 (TPC Area) in which two clusters of stones were found, along with pieces of building material (fragments of mudbricks), numerous animal bones and charcoal. The fill sits on a plaster floor. The botanical content includes mainly charcoal and may represent spent oven fuel. Seeds are few, they belong to different crop types and are highly eroded; they are likely of secondary origin to the deposit.

Unit (22300) (Fl. 12550) is B.160 (South Area) infill consisting mainly of house rubble (collapsed mudbrick, mortar, lumps of plaster) which is interspersed with bone, clay balls, stones and flecks of burnt material. The fill may have been deposited as a single event. It is very rich in plant remains among which glume wheat glume bases dominate (i.e. dehusking waste) and are well preserved, perhaps confirming that infilling happened in one go.

Unit (22396) (Fl. 12694) is a burial fill in B.161 (South Area). It included small fragments of construction material and small lenses of charred material. The deposit is of low botanical density and is composed of materials from different activities – crop processing (glume wheat glume bases), dung burning (large number of small legume seeds) and possibly cooking (some barley grain). In general, burial fills tend to be poor in plant materials and give a mixed-sources signature.

Unit (32046.s3) (Fl. 12717) is the lower section of the infill of a pit F.7740 located in the center of Sp.531 in B.132 (North Area). This part of the fill is ashy and quite voluminous (19 liters of sediment) and differs from the upper layer of the fill that contained small clay aggregates, fragments of plaster and small amount of charcoal. Sample 3 was extremely rich in plant remains (nearly 1,500 items per liter of soil) which are very well preserved and highly diverse: glume wheat glume bases prevail, followed by weed seeds, barley rachis, glume wheat grain, small amount of free-threshing cereal rachis and large pulses (pea and chickpea). There is also a significant quantity of sedge seeds perhaps indicating use of dung as fuel; some wood charcoal is present, too. The composition of the assemblage suggests multiple burning events of the residue deriving from a range of activities. The material resembles rake-out from nearby fire installation(s); the excavators suggest that the deposition may have been a part of a symbolic ritual. More details are required but burning *in situ* also seems possible.

Unit (32086.s3) (Fl. 12952) is the lower, ashy part of a fill of another pit (F.7746) detected in the central part of Sp.531 in B.132 (North Area), though smaller than (32046). The upper fill contained fragments of plaster, whilst the lower fill consisted entirely of charred material: wood, glume wheat glume bases (mainly), weed seeds (e.g. *Taeniatherum caput-medusae*), some barley grain and rachis (2- and 6-row), several complete and fragmented tubers, bitter vetch seeds and a number of sedge seeds. The sample has high botanical density (c.600 items per liter of soil) and based on this, its overall botanical composition and the diversity of sources and processes represented in the assemblage, this unit looks very similar to the lower fill of pit F.7740 (32046). There is a possibility that the two deposits have similar origin.

Units (32112) (Fl. 12605, 12625) and (32115) (Fl. 12680, 12681) are units constituting a fire spot located in Sp.610 (North Area) that contained burned articulated animal bones and some clay objects. The samples from both of these units were rich in plant remains (Fl. 12681 in particular, with over 500 items per soil liter). They are all dominated by glume wheat glume bases but contain similarly large amounts of cereal grain. Also, cereal culm nodes are present in relatively high numbers as are seeds of weed taxa; Fl. 12605, for example, yielded a significant number of *Bromus* seeds. The abundance of glume wheat glume bases (and weed seeds) points to a dehusking event whereas cereal culm nodes could indicate coarse-sieving stage in crop processing. Perhaps the discarded by-products of the two activities were combined in burning.

Unit (32403) (Fl. 12823) is the fill of a burial in B.160 (South Area) that yielded remains of wooden planks. The fill contained traces of building materials (fragments of mudbrick and plaster) and fragments of wood charcoal. Although the flotation sample produced a large number of plant remains, the botanical density is low. Glume wheat glume bases dominate, but the overall composition is quite diverse with a notable quantity of nutshell fragments (of almond and pistachio), free-threshing cereal rachis, some cereal grain and large pulse (pea, lentil, bitter vetch), small-seeded legumes

and sedge seeds. The material derives from a range of activities and sources (crop cleaning, nut shelling, burning of dung) which demonstrates the highly mixed nature of the deposit.

Unit (32413) (Fl. 12658) is a pit fill from B.160 (South Area) that contained some animal bones but was otherwise a relatively clean, clayey, light brown deposit. The botanical density is low; the sample is mostly composed of glume wheat glume bases though a relatively high number of free-threshing cereal rachis is also present suggesting processing of free-threshing wheat and/or barley. Seeds of small legumes and Cyperaceae found in the sample indicate dung burning.

Unit (32070) comprises dirty floor layers in the east part of the south-east corner of Sp.531 in B.132 (North Area) associated with the adjacent oven F.7732 and hearth F.7871. The excavators identified two subsequent layers of dirt patches based on the differences in consistency and color of the sediment. The upper layer was composed of compact laminated deposits whereas the lower layer appeared similar to the corresponding layer excavated across a wider area in this part of the building. The area was excavated using a grid of 1 x 1m squares; a flotation sample was taken from each square – a total of nine out of which eight samples have been examined. Samples 2 (Fl. 12992), 4 (Fl. 12984) and 6 (Fl. 12993) belong to the upper layer. Samples 2 and 4 have high, and sample 6 very low botanical density. They are all almost entirely composed of glume wheat glume bases that are badly preserved suggesting that they may have been trampled on and/or re-deposited across this area. Small quantities of weed seeds confirm crop processing activity; potentially dung-derived seeds are few. The material almost certainly derives from spilled waste/rake-out from the nearby fire installations. Samples 8 (Fl. 12978), 10 (Fl. 12979), 14 (Fl. 12980) and 16 (Fl. 12991) were taken from the supposed lower layer of dirty floors. Samples 8 and 10 are high-density and are very similar in composition to Samples 2 and 4 (i.e. glume wheat glume bases and some wild/weed seeds) though they contain much more wood charcoal (especially Sample 10). Sample 8 also yielded shell fragments of almond, pistachio and acorn. Similarly to sample 6, sample 16 appears 'clean' when compared to the 'rich' samples (particularly sample 2) collected in this area. Sample 14 has moderate botanical density and is also dominated by glume wheat glume bases. Interestingly, the 'poor' samples derive from the (lower and upper) floors directly next to or abutting the fire installations, whereas the high-density samples come from the zone further away from the oven and the hearth – from the south-east corner of the Space. The impression is that the immediate area around the fire-features was kept clean(ish) and that the fuel waste/ashes were routinely swept to the corner, towards the wall post (whose presence is implied by the post-retrieval pit F.7881). Finally, sample 18 (Fl. 12985) is of low/moderate density and was, according to the excavators, taken from floor makeup. However, based on having virtually same contents as detected in the dirty floor samples (glume wheat glume bases, wild seeds), it may in fact represent (or include) another patch of dirty floor.

Assessing whole building assemblages (full analysis)

Full sorting and identification of *c.*63 samples (by AB, assisted by ES this season) represents the first phase of data gathering for final analysis of excavations since 2008. So far this initial work has targeted burned Buildings (e.g. Buildings 79, 80, 131) and other buildings and spaces of particular chronological/stratigraphic interest (e.g. Buildings 89 and 132). The focus is on primary deposits of *in situ* burning (or deposits immediately adjacent to locations of burning, such as oven/hearth rake-outs on dirty floors, fire spots etc.) in order to relate botanical composition to specific locations and activities. This work will continue in earnest in 2017.

Preserved textiles from a burial in Building 131

This season excavation revealed additional finds of textile from B.131 (see Bogaard *et al.* 2015 for the textile remains discovered in 2015). Textile was found in F.7963 (22676), but preliminary observations suggest this material was preserved through mineralization, not carbonization, unlike the majority of textiles found at the site. The textile fragments exhibit a similar weave configuration to the textile remains found in Building 52 (30511) in 2014 (see Fuller *et al.* 2014).

Acknowledgements:

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Chapter 9

Anthracology

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Introduction

This report summarizes anthracological analyses carried out during the 2016 fieldwork season at Çatalhöyük. A total of 163 flotation samples from the 2015 and 2016 seasons were sorted for >4mm wood charcoal macroremains and 81 samples were subjected to preliminary analysis. An overview of preliminary findings and the research agenda for the upcoming fieldwork and study seasons are provided below in two subsections.

Fuelwood use at Çatalhöyük

In line with previously completed research on the wood charcoal assemblage (Asouti 2005, 2013; Kabukcu 2015), analyses aiming to identify fuelwood use and woodland management practices at Çatalhöyük focused on the study of *in situ* (i.e. in fire features) and discarded (i.e. in midden and midden-like contexts) fuelwood waste. A number of units were examined during the 2016 season comprising of *in situ* wood charcoal residues from single burning events. Preliminary results from these units confirmed previously observed high variability in taxon composition from the residues of single burning events. In addition, expedient/outdoor fire features excavated on a 1 x 1m grid in Sp.85 in the North Area provided further insights into taxon composition in these fire features. The analysis of samples from different grids for units (32111), (32112) and (32115) revealed that taxon composition in fuel waste residues from outdoor fire features can vary across space within a defined burning feature, possibly reflecting multiple episodes of use in these features without frequent cleaning of fuel waste and other residues.

Further to the analysis of *in situ* residues of burning events, a number of midden and midden-like discard contexts were also examined during the field season. A number of units excavated in the South Area provided important additions to the midden sequences from earlier levels (e.g. (22345), (22351)). The further study of these units is planned for the next year in order to complete dendroecological analysis including quantitative and qualitative measures of growth conditions, trauma, and condition of wood prior to burning. Furthermore, minimum diameter estimations of original log sizes used in the fires will supplement the existing dataset (cf. Kabukcu 2015). A main aim of the recent anthracological research at the site includes a more detailed study of the midden sequences from the North, TPC and GDN Areas of excavations, as these areas are currently under-represented in anthracological analyses to date.

In addition to residues from fire features and discarded fuelwood waste in midden contexts, we will be expanding detailed anthracological analysis to dirty floor deposits in buildings as well. The aim of this is to provide a building by building sequence of fuelwood use as a means of comparison to the midden sequences. During the 2016 fieldwork season a number of dirty floor deposits from B.132 were examined, yielding interesting results, notably with ubiquitous findings of bark fragments.

Timber use and woodworking at Çatalhöyük

A small number of units with *in situ* timber and/or structural wood elements were also examined during the 2016 field season. A sequence of ladders was recovered in B.131, with evidence of re-setting oak planks in the same cut (cf. (32309)). Another oak ladder was also recovered in the TPC Area, belonging to a larger oak plank, made from a halved oak timber. Three separate specimens were recovered from a bench-like installation in B.80 (F.3433) comprising of badly degraded remains of elm and juniper.

In addition, a number of carbonized wooden artifacts were recovered from burials, many in direct association with the skeleton. The remains of concave wooden objects and bowls from units (22676), (22678), (22641) and (30092) will be studied in greater detail over the next year and will be reported in full as part of the forthcoming monograph. These artifacts made of maple, oak and ash wood bear similarities in carving techniques and materials used to those recovered from the burnt burial in B.52 (cf. (30503)).

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Chapter 10

Plant Microremains (Phytoliths and Starch Grains)

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Introduction

Between June 6th and July 25th 2016, two members of the plant microremains team were present on site. During this period, over 400 samples were collected, from priority and non-priority contexts, including house floors, burials, bins and artifacts (grinding stones and potsherds).

The main work for this field season consisted in:

- Fast-track priority unit analysis: c.110 units identified as priority during excavation were quickly scanned under the microscope to provide fast feedback on phytoliths content. On the basis of the results of this first assessment some of these units were then exported for full study.
- Quick scanning of plant-related contexts and concentration of phytoliths: c.20 samples collected from non-prioritized contexts related to plant activity or particularly interesting for phytolith analysis (concentration of pure phytoliths) were quickly scanned at the microscope and some of them exported for full analysis. These samples included, bins, burial infill, baskets and other burial deposition practices.
- Sampling of grinding tools and pottery for starch and phytolith analysis: these were all exported in the form of dry and wet sediment and control samples to check for contamination.
- Grid sampling of floor surfaces for spatial analysis: samples of in-phase floors were collected in a 1 x 1m grid to be analyzed spatially for phytolith, starch and geochemical contents in order to identify possible activity areas inside buildings. Two buildings were sampled (B.132 and B.160) for a total of eight floor surfaces.

Micro-remains finds of 2016

A cautionary notes on the results from onsite analysis: all these results refer to a study conducted on non-extracted samples. This implies that the precision of identification is low and quantification (which is at the basis of phytoliths studies) not possible. All the results reported here are to be taken with caution and, if possible, interpretation should be re-evaluated after the final laboratory analysis.

Botanical remains in burials

During the 2106 campaign several burials were discovered and excavated in both South and North Areas. Burials are normally quite poor in charred material and understanding the possible use of plants in burial contexts has so far proved difficult. Part of the problem related to this issue may be related to the preservation conditions of botanical macroremains, which, in their uncharred form are very rarely preserved. Phytoliths can aid and have proved useful in tackling this issue

at Çatalhöyük. During 2016, two exemplary contexts yielded good phytolith assemblages: (22194) from F.3808 in B.5 and (32403) in B.160.

Unit (22194) from B.5 presented a somehow puzzling situation in terms of phytolith assemblages. Several samples were collected from different parts of the burials and from material adherent to the bones. 22194.s4 consisted in two fragments of compacted sediment with visible strands of white/grayish plant residue attached that seems to follow two perpendicular orientations. The two strands had a similar phytolith composition, with elongate thin psilate, irregular and regular dendritics, sinuate and hairs and prickles. No bulliforms were observed indicating that the residue belonged to grass plants, stripped of the leaves. 22194.s7 comes from the same unit and presents the same type of white/grayish residue. However the composition is drastically different: firstly it presents a much lower concentration of silica bodies and the ones observed could not be ascribed to any known morphotypes (Fig. 1a). They might be fibers (possibly linen) but further laboratory analyses are necessary in order to confirm their identification. 22194.s8 is composed of a consolidated lump (Fig. 1b) and some loose sediment and seems to be definitely a sort of textile/woven cloth, made of two different plant materials: reed leaves and the same fiber as 22194.s7. Curiously, the loose sediment contains very low concentration of phytoliths and morphotype different from the ones in the previous sample, indicating that the consolidated sediment represents only the impression of the textile rather than the actual textile. Samples 22194.s3 and 22194.s5 again represent different compositions in respect to all other samples, including short and long cells typical of *Stipa* sp. (esparto grass type) and wheat/barley type elongate dendritics. This might represent plant material that was deposited loose in the burial rather than the rests of baskets/mats, indicating the presence of complex practices related to plant use in burials.



Figure 1. Samples from burial (22194): (a) micro photograph of the unknown morphotype that dominates sample 22194.s7; (b) macro photograph of sample 22194.s8 showing the distinct fiber-like structure.

The burial F.7828 discovered in B.160 revealed an adult skeleton Sk (32403) with a wooden plank positioned behind the spine (Fig. 2). This finding is similar to the burial F.8206 discovered in 2015 in B.17, which presented a very similar deposition (see Archive Report 2105, p. 128). Several samples were collected from the plank, the material adherent to the skeleton and the sediment underneath the bones in order to assess possible differential deposition of plant material in the burial.

The preliminary onsite analysis was conducted only on three samples collected from the 'wooden plank'.



Figure 2. Burial Sk (32403) discovered in B.160, showing the remains of a possible wooden plank located behind the vertebral column of the skeleton.

Sample 32403.s3 was collected from the upper area of the body, close to the wall of the grave cut and presented a good concentration of phytoliths from dicotyledons (both wood and broad leaves morphotypes) as well as grass morphotypes including inflorescences of wheat/barley type. Sample 32403.s4, collected closest to the upper part of the skeleton, presented the richest assemblages, composed almost exclusively by grass leaf/culm. Finally, 32403.s5 collected next to the feet of the skeleton, presented a lower concentration of phytoliths, substantially just grass leaf/culm morphotypes. Differences in phytolith concentration and assemblages might have been due to the different micro-levels at which samples were collected. However, the assemblage of 32403.s3 might represent the board, whereas 32403.s4 and 32403.s5 might be the remains of a grass mat deposited on top of the board. If this is confirmed by further analysis it will indicate a higher concentration of plant material towards the upper part of the body.

Baskets and containers from burial and domestic contexts

Several baskets and basket-like features were discovered during excavations, both in burials and in domestic contexts. These features usually present very well preserved and pure phytolith remains, which makes them amongst the most-informative contexts for onsite analysis.

Burial F.3813, discovered in B.5, presented a cranium and mandible Sk (22196) covered in cinabar and placed in what seemed to be, to the naked eye, a container (basket or bowl). Five samples were analyzed for microbotanical remains from this finding, revealing a very complex use of several containers/plant textiles one inside the other. Several different morphotypes were identified in the different samples including elongate cells of *Juncus* sp. (rushes) and short cells of *Stipa* sp. (esparto grass type). In sample 22196.s2, several different worked plant material were found, including clear signs of a textile composed possibly of linen fibers and the residue of what had been described as a wooden plate (possibly more like a shallow bowl) on which the basket containing the skull was deposited (Fig. 3a).

An interesting example of basketry from domestic contexts was uncovered in B.132 (Fig. 3b). During the excavation, it looked like one (or possibly two) basket(s) left on the earlier floor prior to the laying of the makeup layer for the following floor. It showed the characteristic circular structure typically associated with baskets at Çatalhöyük. Several samples were collected: 32031.s5, 32031.s4, from the basket's center and sides; and 32031.s2 and 32031.s3 from the floor on which basket was found. Onsite analysis showed that the basket was made of a single plant *Stipa* sp. (esparto type) and it might have contained still some hulled grains as a notable quantity of elongate echinates and dendritics (wheat/barley type) was found, especially in the center of the basket. Analysis of the floor samples surrounding the basket yielded low phytolith concentration and did not present any of the morphotypes identified in the basket samples, thus excluding possible contamination of the basket's samples. It might be suggested therefore that the basket was kept in the house for daily consumption and that a modest quantity of grains was kept in this temporary storage container in order to be processed within the domestic environment according to the daily needs of the building inhabitants.



Figure 3. Two samples of baskets/containers collected from (a) burial context (22196) in B.5; and (b) domestic context (32031) in B.132.

Spatial analysis of midden deposit in Space 85

In Space 85 a midden deposit was excavated in a grid of 1 x 1m with samples collected for specialized analysis from each square. This allowed a detailed study of the spatial differentiation of archaeological materials and bioremain. Phytoliths indicated that several processes were involved in the formation of this midden, as indicated also by the archaeological excavation.

Unit (32106), described as midden deposit, presented the highest concentration of phytoliths in grids 10, 11, 13 and 15 (south-west part of the deposit adjacent to western wall F.7712). Phytoliths of mainly grass culm and leaves, presented signs of burning and melting indicating high temperatures involved in the formation of this assemblage (above 800°C). This suggests secondary deposition of plant material burned somewhere else. However, the high number of silica skeletons (phytoliths in anatomical connection) and the relatively scarce presence of mechanical taphonomic processes might indicate rapid burial and relatively little post-depositional trampling.

Unit (32107), an ashy deposit within the midden presented generally low concentration of phytoliths. The assemblage seems to represent residues of mostly wood burning with little grass input. No particular signs of high temperatures were detected in this deposit.

Units (32111) and (32112)/(32115) [considered the same context a posteriori] represented fire spots within the midden deposit. Unit (32111) presented very low phytolith concentration, mainly recovered from grid 12 in the eastern part of the deposit. The assemblage seems to be composed exclusively from leaf/culm morphotypes and some reed type long cells, which might indicate that this is the residue of clearing of matting/basketry byproducts rather than residues of crop-processing activities. On the contrary (32112)/(32115) present very high phytolith concentration, a mix of cereal leaf/culm and wheat/barley-type inflorescence indicating possible crop-processing residues. Phytoliths show signs of burning and partial melting, especially the silica skeletons of inflorescence, indicating high temperatures involved in the processing of cereals and possible secondary deposit rather than *in situ* burning.

Finally, (32113) appeared as a clay deposit. Phytoliths were concentrated in the central-eastern part of the deposit (grids 8, 12, 15 and 14) and consisted of a mix of leaf/culm and inflorescence morphotypes. Phytoliths in this unit looked burned and partially melted indicating their provenance from high temperature fires (above 800°C) thus suggesting a secondary deposition rather than *in situ* burning.

List and preliminary results of the onsite quick-scanning

The list of samples analyzed and the results of onsite scanning are fully integrated within the project's database (Microbotany Central Database/Field Analysis).

Research projects

Judit Barastegui conducted in 2015/2016 an investigation of practices related to the use of fuels alternative to wood as part of her BA final dissertation¹. She analyzed phytoliths and spherulites from 14 samples collected from combustion structures to understand the possible use of dung, crop-processing leftovers and grasses in general as fuel. Her results indicate that there is a constant presence of C3 grasses (especially leaves and culms but also inflorescences) in the fire residues. This can be associated with the use of crop-processing leftovers. The presence of dung as fuel, though suggested in her study needs to be confirmed with further analysis.

In 2016, two PhD students at Universitat Pompeu Fabra will begin research that includes samples from Çatalhöyük. Jonás Alcaina Mateos will include in his dissertation some of the floor samples collected in grids as a case study to test several different spatial analyses methods for the archaeological detection of domestic activity areas through a combination of botanical microremains and geochemical signatures. A second student, whose selection process will be finalized in October, will work on microbotanical remains to reconstruct foodways at Çatalhöyük, including the analysis of phytoliths and starch from grinding stones and floor sediments.

From January 2017, a PhD student at the University of Newcastle will start work under the supervision of L.-M. Shillito and M. Madella on the project “Prehistoric fuel use in the archaeological record: developing the potential of ash through integrating microfossil analysis and geochemistry”, which will incorporate samples from Çatalhöyük.

¹Barastegui Alegre, J. 2016. *Aproximació a l'ús del combustible als nivells Neolítics de Çatalhöyük (Konya, Turquia). Anàlisi de fitolitos i esferòlits de les estructures de combustió* (in catalan). Department of Archaeology. Universitat de Barcelona.

Chapter 11

Figurines

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Introduction

This season Lynn Meskell and Lindsay Der were joined in the field by Monique Arntz and worked closely with Christina Tsoraki, lab head for Ground Stone. During this time we recorded 260 figurines in total. Only 50 came from the 2016 excavations, while the rest were returns from other labs covering previous years. As is the norm at Çatalhöyük, zoomorphic figurines (N=33, 3 horns, 10 quadrupeds) were the most numerous, followed by abbreviated forms (N=11) and finally anthropomorphic examples (N=2).

Of those excavated this year the majority were made from clay (48), followed by limestone (2) in the case of the two anthropomorphic examples. In terms of location 41 were found in the North Area, seven in the South Area and two from TPC. As in previous years figurines were predominantly excavated from midden areas then external spaces, rather than buildings.

This season, we had a unique find in the history of the current project. Unlike the most common pattern of figurines being found in secondary deposits such as middens and building fills, excavators recovered the first human figurines from primary depositional contexts. Two limestone figurines from the later occupation levels (TPC Area, Sp.594, F.3855, Unit (20736)) were placed near-by each other in very clean makeup of a platform. Both were associated with one or more other artifacts. These two finds came from the same general area as the headless stone figurine found last year in building fill (31852.x5). These shall be described in detail below.

Limestone figurines

Figural analysis (Carrie Nakamura and Lynn Meskell)

Figurine 20736.x1, Figure 1 (1042g, 17.19cm (H) x10.96cm (W) x 8.74 cm (D))

20736.x1 is a large female figure carved from re-crystallized limestone (Fig. 1). The figure gives the impression of a body with overabundance of flesh, showing rather corpulent limbs, stomach, buttocks and breasts. The flesh of the stomach and breasts are notably sagging (the stomach from the side appears flap-like), while the substantial buttocks are quite raised, with an angular rather than rounded shape; the limbs and neck have many fat rolls (Fig. 2). All of this suggests a good and pragmatic knowledge of the human body and also a penchant for displaying technical virtuosity. The choice to deeply undercut the stone so as to display the stomach flap or arms separated from the body seems to showcase a kind of technical prowess that was more performative rather than necessity. We might note a similar display of virtuosity in stone carving in the carved spheres found this year and described by Tsoraki in this year's Ground Stone report.

The body is extended, but the piece is unable to stand. Similar to the stone figurine we found last year (31852.x3) both figurines from 2016 are carved from limestone and depict standing postures, and none were freestanding. There are similar examples from Mellaart's excavations includ-

ing Ankara 79-22-65 and 79-452-65. The large breasts are splayed to the side, as if the figure was depicted lying down. The arms are bent with the hands resting on and under the breasts. The arm placement with hands resting on the breasts has been noted in other specifically female figurines (10475.x2, 7582.x1) whereas others are placed directly under the breasts (31852.x3, 13161.H3).



Figure 1. Figurine 20736.x1, three views (photos by Lynn Meskell).

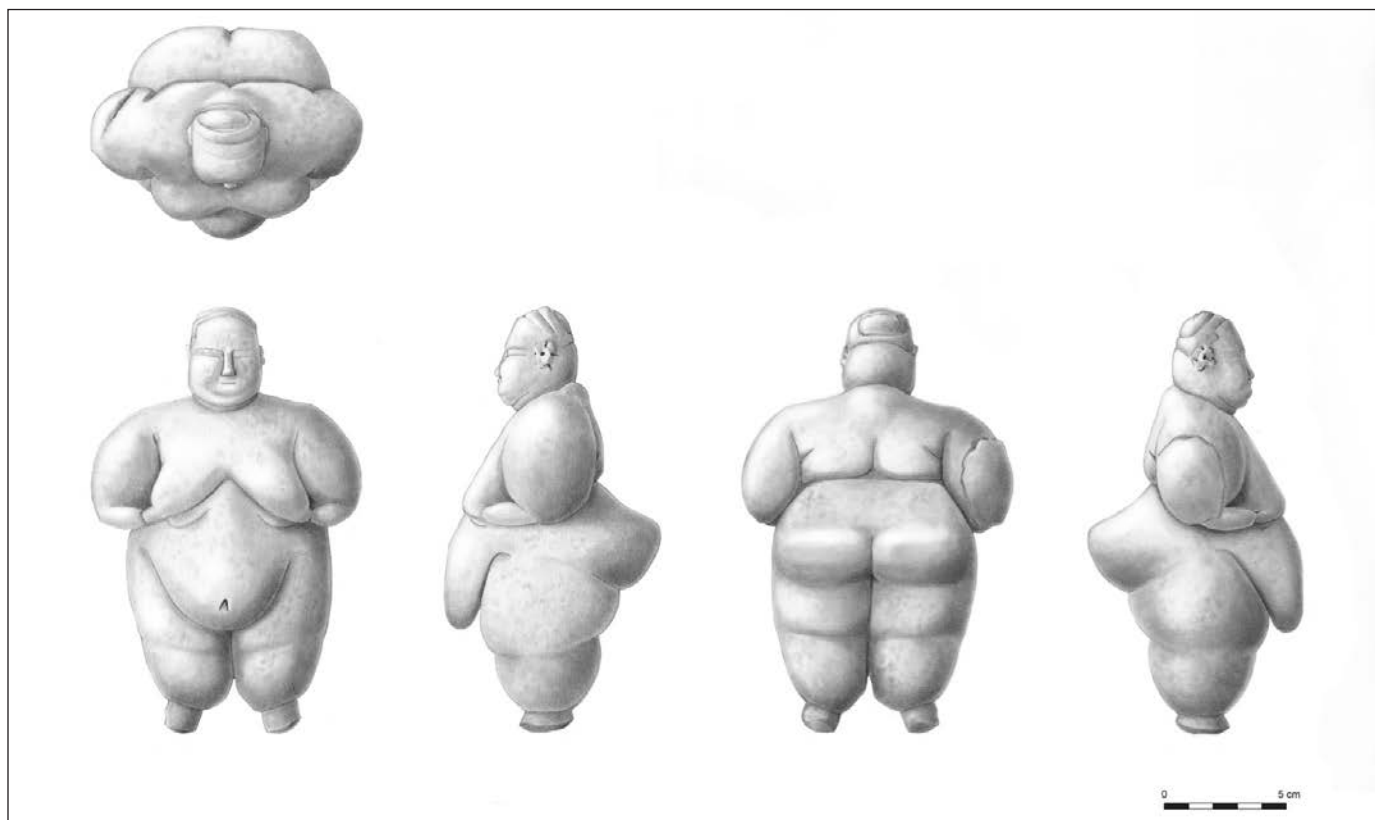


Figure 2. Figurine 20736.x1 (illustration by Kathryn Killacky).

The hands and feet of this figurine are disproportionately small compared to the rest of the body and the feet appear peg-like rather than being naturalistically rendered. This is typical of stone figurines of the human form at the site. The head and face show more weathering. The ears nose and chin are carved and the eyes are indicated by incised, elongated rectangles that extend towards the ears; incised lines also indicate the mouth, chin, hair (or head adornment) and neck fat extending around the back of head roll. The navel is incised as an asymmetrical triangle pointing upwards, and is more roughly done than the other lines, which are very deliberately incised and naturalistic. Christina Tsoraki has suggested that this figurine was manufactured with considerable technical expertise. The stone was carved with a very thin tool, probably made from flint or obsidian (see below). While some stone objects have multiple groves but this figurine does not, demonstrating highly proficient technical execution with very fine and controlled movements.



Figure 3. 20736.x1 in situ (photo by Lynn Meskell.)



Figure 4. 20736.x1 with platform (photo by Lynn Meskell.)

Calcium carbonate accretions appear on the right arm and right ear; the right arm is slightly damaged due to this accretion. This figurine was found lying face up with its head pointing to the northeast. There was an obsidian blade placed just under and to the left of the left arm (Fig. 3). This figurine was found lying face up, lying directly on a platform (Fig. 4) and in very clean makeup fill. Samples from around the figurine were taken and will be analyzed by Eline Schotsmans at Bordeaux University. No residues were evident on the figurine itself after microscopic examination according to Tsoraki.

Figurine 20736.x3 Figure 5 (54.40g, 6.92cm (H) x 3.74cm (W) x 2.35cm (D))

20736.x3 was found just north of 20736.x1 in the same matrix. This piece was carved and incised from pale yellow limestone with visible black inclusions. Some red pigmentation, possibly ochre, is visible on right foot sole and on one of the ears (Christina Tsoraki suggests that this may have been applied and was not accidental staining). This figure is of a similar type to 20736.x1, with its body extended (but unable to stand) and arms bent across the chest with hands resting on the breasts. It is less corpulent, but still gives the impression of abundant flesh. Fingers are delineated, albeit very

crudely. The peg-like feet are very small compared to rest of body, (see above). The stomach is moderately protruding and its lower margin along with the joints from the upper legs form a triangular pubic region. There are similarities to example 10475.x2 made from speleothem that was discovered in 2004 by the current project. There are also parallels to 20736.x3 with 31852.x3 in that the pubic region is shown in general terms to indicate flesh and fat, although not specifically by a pubic triangle. However, this is not always the case as we have suggested before. Indeed the maker of the first stone figurine found this season 20736.x1 went to great lengths to obscure the genital region altogether with an exaggerated stomach flap.



Figure 5. 20736.x3, photo courtesy of Monique Arntz.

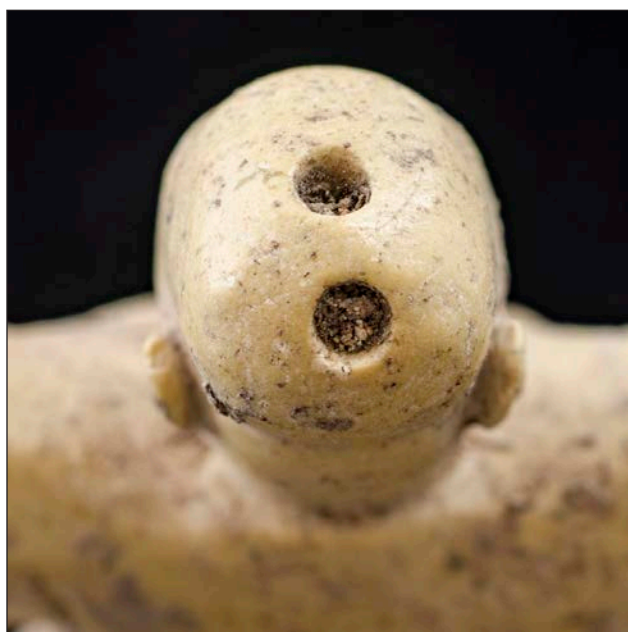


Figure 6. Detail of 20736.x3 (photo by Jason Quinlan).



Figure 7. 20736.x3 in situ with galena (photo by Jason Quinlan).

Folds are incised on the front and back of the arms as well as on the back. The face is finely modeled. The eyes, nose, mouth and ears are rendered in a realistic way, with the eyes appearing rounded, slightly bulging (possibly lidded or closed?) with the suggestion of a brow and cheekbones. The head is elongated and top/back of the head projects diagonally backwards. On top of the head are two perforations that are connected diagonally (Fig. 6), suggesting that the object could have been strung and hung or worn. This too is a unique feature and suggests that at some time the object had a more mobile existence. The figurine was found lying on its left side with its head pointing north to northeast. It was embedded in or placed on top of a lump of gypsum. Directly to the left of the head, excavators found a piece of galena (Fig. 7) and two blue beads noted in the excavation notes.

Both figurines found in (20736) were deliberately deposited and, in fact, comprise multi-artifact deposits; an obsidian blade was found next the left arm of 20736.x1, while a 20736.x3 was facing piece of galena. Apparently, excavators also found two blue beads nearby to 20736.x3, although neither the figurine team, nor the ground stone team was able to examine them. While these deposits very likely indicate a kind of ritualized act, we should be circumspect in our projection of the possible meanings of these gestures. Rather, we should consider them in the specificity of their context – in relation to similar practices at the site, their occurrence in the sequence of occupation, and trends and changes in social practice over time.

These finds may echo certain practices associated with the burial of humans in platforms: many bodies interned in buildings are placed in platforms; most are placed on their sides, but there are some rare instances of supine placements (e.g. sk. 4593, F.492); ochre and pigment appear in burials in lumps and in scatters but few other contexts (only in wall paintings, and a few cluster units); and many bodies are found with burial goods such as chipped stone and beads. However, we have never found a human figurine (or any figurine) in direct association with a skeleton and they do not appear to be a common burial inclusion. Only a few clay figurines have been found in burial fill units, and the one instance in which a stone human figurine was found in a burial came from redeposited fill, possibly from the midden below the burial (10475.x2, Chaffey and McCann 2004).

The finds in (20736) rather suggest that in the late levels of Neolithic occupation at the site, some figurine practices may have mediated relations between the living and dead. Given the similar treatment of these figurines to human burials in platforms, we might also consider the possibility that some figurines depicted dead beings. However, the TPC Area excavations to date have not recovered any human burials. The platform (F.3855) in which these figurines were found has not yet been completely excavated so human burials may yet be recovered from this platform; but if they are not, then these figurine deposits would strongly evoke a practice that mimics an earlier practice of placing human bodies in platforms (see Fig. 4). We will wait until there is more information about this particular feature to explore this idea further. But regardless of whether or not these deposits cite, substitute or supplement human burial practices, it is worth exploring this connection between figurine bodies and dead bodies in the future as it is it could link up with Hodder's claim that in the later levels there is a shift in focus from the fabric of the house to the (more mobile) fabric of human relations (Hodder 2014: 16). If the social power of the dead (or the ancestor) became re-focused in figurine bodies, this could point to a radical change in the role of figurine objects at the site and perhaps beyond. It should be noted that the meanings and practices surrounding all figurine types is unlikely to have held static over the millennia of site occupation.

The bodies themselves also convey a strong impression of abundance (if not excess), and maturity. As we have argued previously, the human figurines at Çatalhöyük exhibit a distinct emphasis

on particular body parts, the '3Bs': breasts, buttocks and bellies (Nakamura and Meskell 2009). Most renderings of breasts and bellies give the impression of females who are quite mature - who are not in but rather beyond their peak reproductive years. Overall, these bodies display an overabundance of flesh, which we have suggested could emphasize a particular status acquired in maturity and longevity.

One notable trend across the site is that human figurines with a 3B emphasis appear almost exclusively later levels - after Levels North G and South P - and the most impressive examples, both from a technological and an artistic perspective, occur very late in the South Area. Until quite recently, evidence from the site has supported the idea that Neolithic life at Çatalhöyük was 'aggressively egalitarian' (Hodder 2006), however some findings from the last few field seasons have prompted some reconsideration of this idea. Ian Hodder (2014) now suggests that in the later occupation of the site, personhood became less based on community membership through the larger history-house group, and more associated with individual ties of exchange. Alongside this shift, he describes some evidence for a trend towards distinctiveness and individuation in certain items such as beads and bone points (2014: 16). One might argue that anthropomorphic figurines such as these might give some support to this idea. However, we should note that just because this particular category of objects 'represents' the human form in some fashion, it should not be literally read as a direct analogy with human thought or action. Rather, figurines, as we have argued from the beginning, should be regarded as a process; accordingly, any interpretation of human figurines as supporting a theory of increased individualization in the later levels must be argued from a multi-levelled consideration of production, representation, use/ biography, and discard. While evidence is scant, we can present some possible lines of future exploration below.

While the site corpus of 3B type figurines comprise varied bodily representations, some representational conventions are apparent to the extent that some could almost be said to comprise a distinctive style or type. For instance, the figurines from 20736 have the same posture and pose and attribute shape (legs, arms, shoulders, buttocks, feet). However, 20736.x3 is significantly smaller than 20736.x1, and in the details, they appear different enough to suggest the possibility that they are meant to depict some kind of difference, either in identity, age, or perhaps more abstractly, status. Alternatively, this could also simply be attributed to different figurine makers. (see discussion by Tsoraki below).

While the figurines may well embody an idealized or specific body kind rather than actual individuals, they demonstrate some knowledge of how actual bodies accumulate fat and these features are disproportionately small compared to the rest of the body. For instance, there is an emphasis on fleshy parts of the body that tend to accumulate fat. Not only the 3Bs but also the upper legs and arms, as well as areas of the neck and back are prone to weight gain, are emphasized. Hands and feet have a much more limited capacity to bear extra fat. In this regard, the figurine bodies do make reference to real bodies - if not individuals who bear such an appearance, then bodies that accumulate fat in a physically accurate way. Pearson and Meskell (2013) have drawn attention to the importance of considering the physical or lived body and the representational body in tandem; specifically, they remind us that flesh is made and modified through food consumption, physical activity, and health, which not only produces a specific physical appearance, but also reflects a range of lived conditions. For instance, an abundance of body fat comes not only from the liberal consumption of calorie-rich foods, but also from low levels of activity: energy ingested exceeds energy expended (Pearson and Meskell 2013). This metabolic process then lends itself to

the construction of social status through such behavior, especially in contexts in which food sources and procurement require substantial amounts of labor.

At Çatalhöyük a link between fat and status could have arisen from a variety of scenarios. The potential for fatness could have become intensified in the shift from a sharing to an exchange economy, from an egalitarian sharing of resources in earlier levels to more independence and self-sufficiency in the later levels (see Hodder 2014). Alternatively, it might have been easier to accumulate fat in a social system of community food sharing, given that high-calorie foods require more intensive processing. Whichever the scenario, such bodies would likely remain few in number, and these individuals – with good access to high-caloric food while maintaining low activity – may have held an elevated status in the community. The fat female body would have provided a potent figure of high status and success in this changing social landscape; 20736.x1 and 20736.x3 in particular convey this on several levels, embodying reproductive, economic and social success. While not evoking bodies in their reproductive prime, they do suggest having been through the process of bearing and birthing offspring. Moreover, as mature bodies they have endured and thrived beyond these life events (Nakamura and Meskell 2013). Fatness as rendered in these figurines, thus suggests a specific image of maturity, one that evokes endurance and accumulation (both nutritional and social) writ large in the flesh. Although we have too little information at this point to make any specific argument for or against, it is worth exploring further a possible link between human individualization to the accumulation of status in the socio-symbolic world of Neolithic Çatalhöyük.

Ground stone analysis (Christina Tsoraki)

Both figurines were subjected to a detailed technological analysis focusing on manufacturing and use-related traces. This stage of the analysis was performed with a NIKON SMZ645 stereomicroscope under magnifications up to 50x. Detailed analysis of carving techniques and overall surface modification allowed for the reconstruction of the *chaîne opératoire* and the sequential timing in the flow of carving actions. This fine-grained level of analysis of the two figurines reveals significant differences in the execution and quality of the working, possibly suggesting that these were the work of different people with varied skills and knowledge. Both figurines were examined under a stereomicroscope for potential residues such as pigment prior to cleaning (rinsing of the surfaces with distilled water without the use of brushes) and then photographed in their original recovery state. Following this, the figurines were subjected to further microscopic analysis, and then they were photographed in a clean state, 3D modeled and illustrated.

20736.x1 (Fig. 8) survives complete and shows no evidence for thermal alteration. It is made of recrystallized limestone/marble (of low quality). The surface of the figurine is smoothed and in places, such as on the buttocks and stomach area, is polished. The whole surface, however, has a rough-looking appearance, the result of post-manufacture weathering. The accretions formed on the surface are carbonate-based and they occur on different parts of the surface, but especially on the head around the ears and the face. Due to the weathering of the surface some of the original incised features do not retain their original depth. This is particularly evident on the face. No residues were detected on the surface of the figurine. Considering, however, the degree of surface weathering, this could be an artifact of preservation.

The whole surface was smoothed first before the different grooves were incised. There is great consistency and precision in the execution of the grooves and incisions delineating the different bodily and facial features, but also in the finishing of the groove. A specific sequence of actions was followed during the carving; for example, the sequence of incisions delineating the arms precede those used to accentuate the fat on the back and waistline on the left and right sides of the back of

the figurine. Similar recurrent sequences of carving to delineate the legs and their fatty areas occur on both sides of the figurine and indicate a highly considered and structured *chaîne opératoire* (Figs. 9 and 10). The ends of the incisions are very regularly finished, and closely replicated on both sides as seen in the incisions delineating the upper arms and the stomach (see Fig. 8). The interior surfaces of all incisions and grooves—with the exception of one groove—are nicely smoothed and do not have irregular surfaces with multiple striations. This is also the case for the deep groove that delineates the protruding stomach of the figurine. Similarly, the working of the area of the lower leg shows that the rounded form was achieved by applying consistent pressure and controlled strokes during grinding to avoid the creation of facets preserving therefore the figurine’s symmetry.

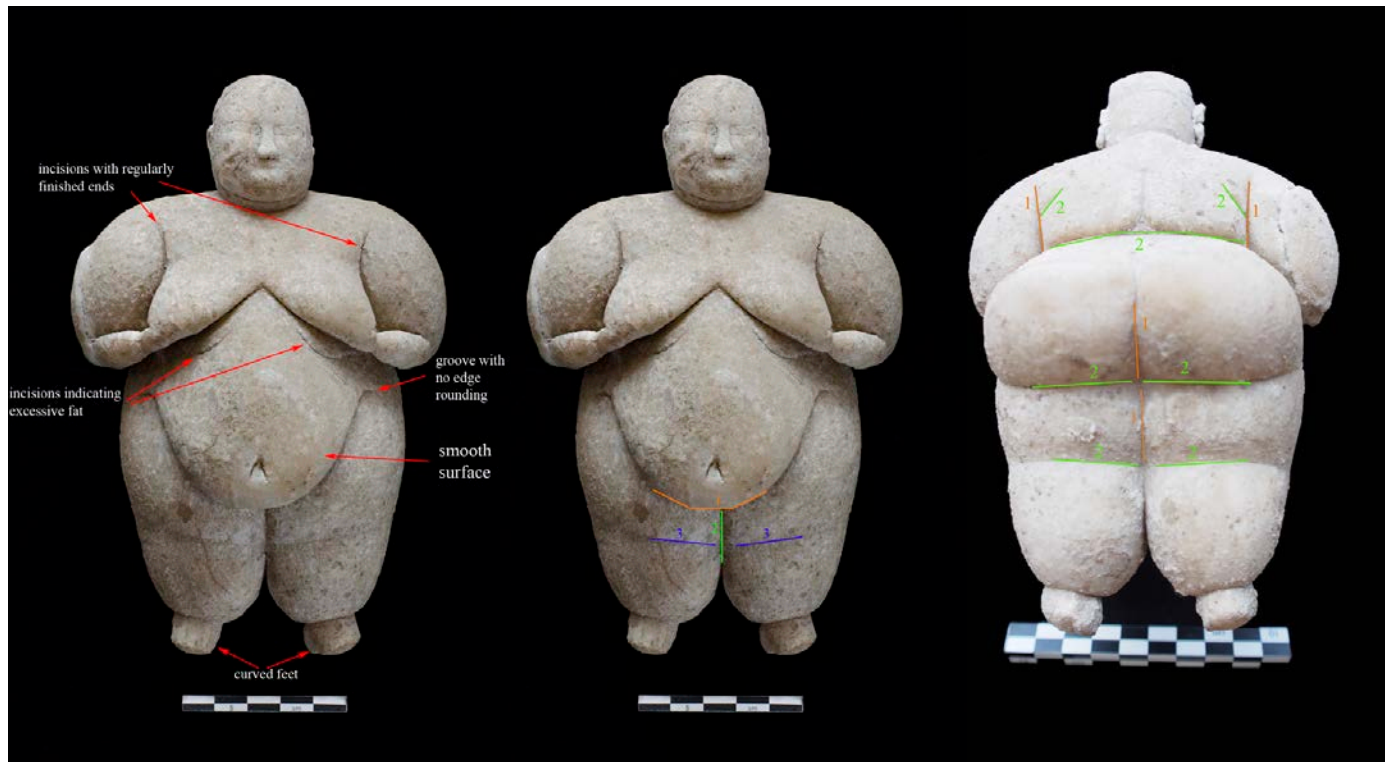


Figure 8. 20736.x1. Front view indicating technological features. **Figure 9.** 20736.x1. Front view with sequential timing of carving actions. **Figure 10.** 20736.x1. Rear view with sequential timing of carving actions. (All photos by Jason Quinlan. Annotation by Christina Tsoraki).

Among the bodily features that stand out are the ears, possible head ornament, and the downward sloping stomach and breasts. The ears, where large size accretions had formed, have a centrally drilled perforation of a very regular form that is surrounded by three incisions. The incisions were created by gouging. One of the ears has a tiny shallow hole on the tragus possibly indicating piercing. Further details such as the double chin, fine incisions on the front and back side that mirror each other to indicate excessive fat, a raised area at the back of the neck to indicate a layer of fat (neck fat), all show great attention to detail and a preconceived plan of how each feature should be depicted (see Figs. 8 and 10). Regarding the posture of the figurine, the bottom side of the feet of the figurine is very curved, which would have prevented the figurine from standing unaided.

Overall, the manufacturing traces suggest great attention to detail and the quality of the finishing. The execution indicates great control of movement (strokes), consistent technique and fluidity in the carving action. The consistency in the carving technique and the finishing of the surface also suggests that the maker had a very clear idea of what they wished to achieve and the way different

bodily features should be depicted. The only feature, however, that does not conform to this is the navel, which was not carefully shaped and has a jagged appearance.

Due to the weathering of the surface it is not possible to say anything conclusive about handling. The differential degree of smoothing with the limited polished patches is the result of the weathering process (i.e. surfaces have lost their smooth/polished appearance) and not wear caused by handling. It is worth noting, however, that some of the details are still clearly delineated, and no post-manufacture rounding of the edges of the incised features is visible (as seen for instance in the ends of the grooves delineating the stomach shown in Fig. 8), suggesting that prior to deposition the figurine had not seen heavy handling (or at least if there was some form of handling or curation, it has not left visible traces on the surface).

In terms of the toolkit employed in the manufacture of the figurine a tool with a thin edge, most likely a flint or obsidian blade was used for the carving of the incisions. The placing of an obsidian blade in close proximity to the figurine during deposition perhaps makes reference to the close association of the two objects (or materials) during the stage of manufacture. A second stage in the modification of the incised features entailed the smoothing of the interior of grooves and incisions with a material of moderate hardness and abrasiveness, probably a pebble with a very thin edge, in order to erase all the irregularities caused during carving. Abrasive tools with different degree of coarseness were used for the shaping and smoothing of the entire surface.

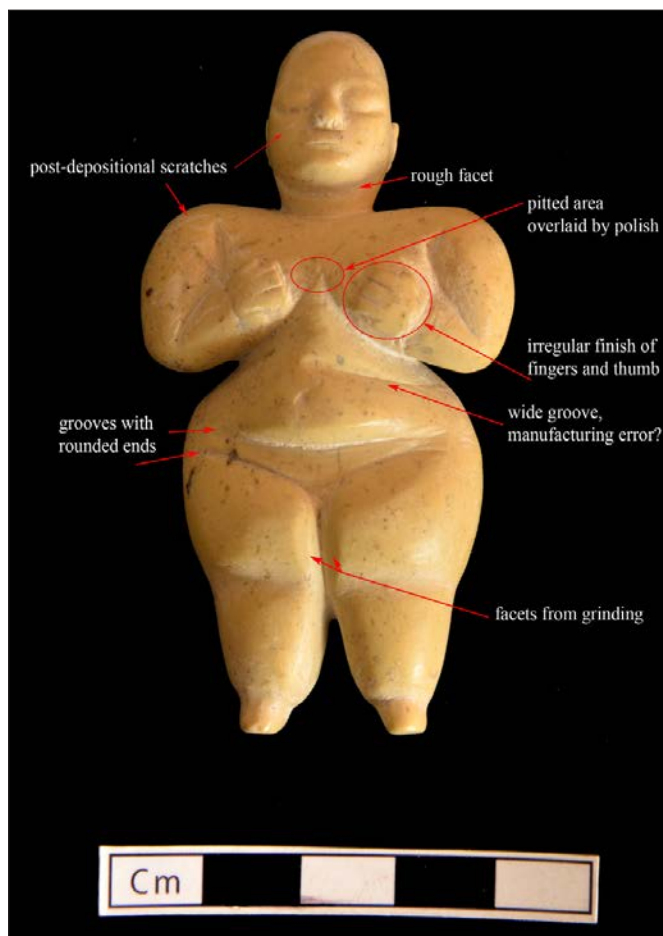


Figure 11. 20736.x3. Front view indicating main technological features (photo by Monique Arntz, annotation by Christina Tsoraki).

20736.x3 is the second figurine found in B.150 in TPC. It was found in the makeup layer of the platform in close proximity to 20736.x1. The figurine was found resting on its side on a lump of marl (sampled in the field). Next to it, there was a flat piece of galena (20736.x2), which, when seen from a distance, resembled the obsidian blade found next to 20736.x1. The figurine is complete with slight damage on one ear and the end of the nose, and a couple of post-depositional scratches visible on the shoulder and face (Fig. 11). Contrary to 20736.x1 no weathering or accretions are visible on the surface of 20736.x3. It is made of a dark yellow limestone with black inclusions; the color of the stone is quite intense, but this is also the result of the polishing of the surface.

The entire surface is well- to highly-polished and the various bodily features (eyes, ears, pubic area/stomach, fingers, mouth line, waistline on the back side, etc.) were incised and in some cases are depicted with wide and very shallow grooves (e.g. the knees). In most cases the surface texture of the groove interior is rough exhibiting multiple small-sized grooves (Figs. 11, 12 and 13). The most carefully finished incision (i.e. incision with a nicely smoothed interior) is the one delineating the thighs below the buttocks. Multiple facets

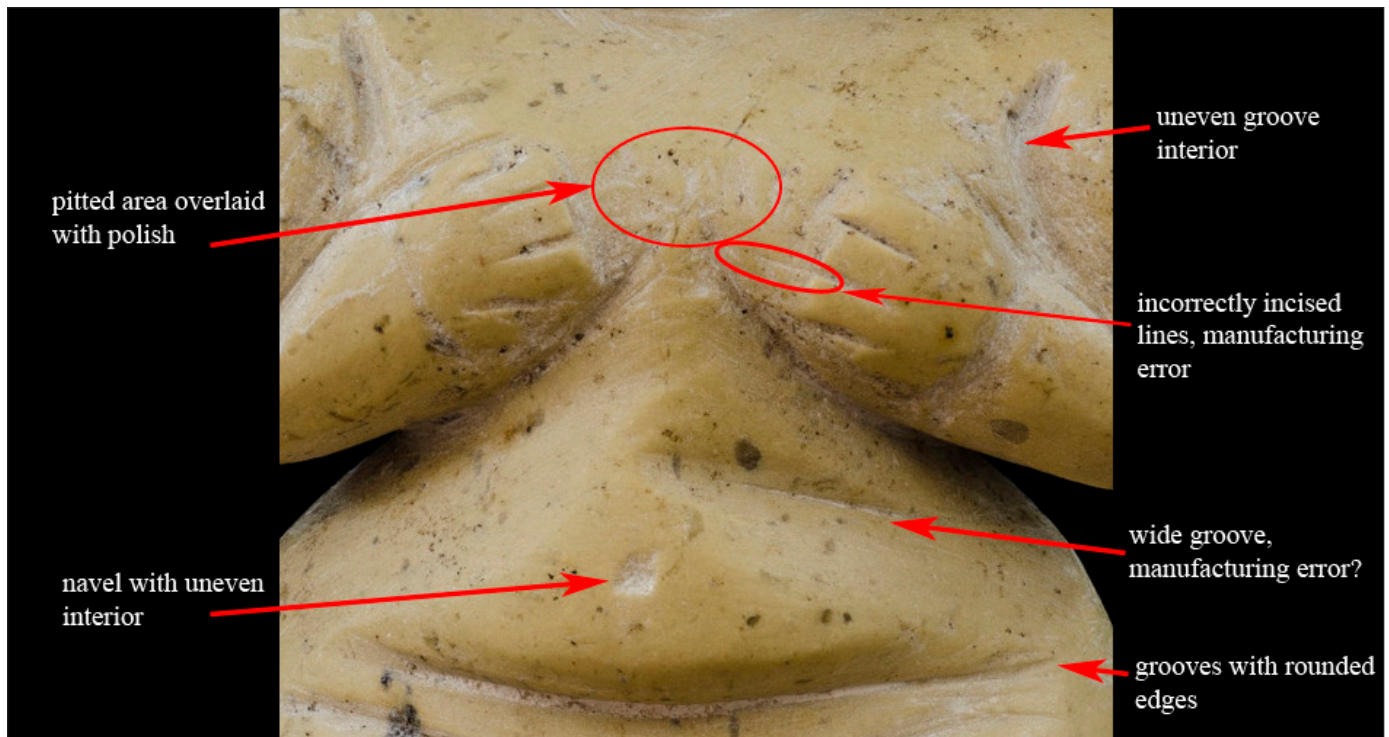


Figure 12. 20736.x3. Detail of front view (photo by Jason Quinlan, annotation by Christina Tsoraki).

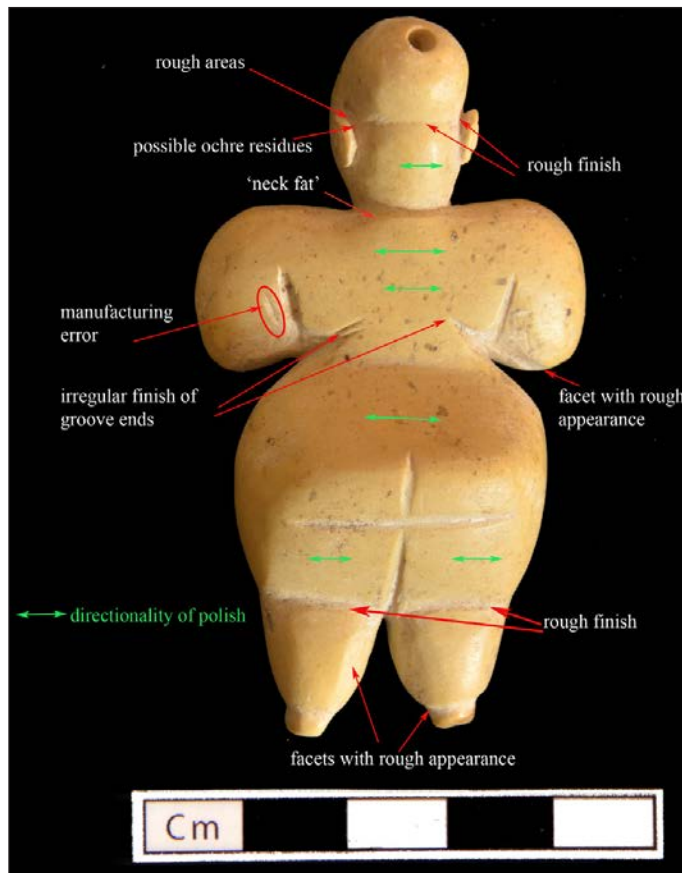


Figure 13. 20736.x3. Back view indicating main technological features (photo Monique Arntz, annotation by Christina Tsoraki).

with relatively rough appearance are visible around the ankles, on the shoulders, under the chin and under the arms. Flattened facets with multiple deep striations are also visible on the interior part of the lower legs, seen more clearly from the back (see Fig. 13). Similar to 20736.x1, the neck fat is also depicted, but it is considerably less pronounced. Limited traces of possible red-colored pigment (ochre?) were identified around the ear where the surface is rougher, and on the bottom of the right foot. The possible ochre residues were sampled on site by the conservation team, and will be sent for further analysis. Possible white plaster/marl residues seem to be present inside some of the incised details such as the incisions indicating the pubic area/stomach (the incision below the stomach), the incision below the buttocks and the one on the thighs on the back side.

The facial characteristics depicted include protruding eyes and nose, a mouth created with a straight incision and the chin. The details on the face are well executed showing consistency and a good degree of finishing. The surface is

nically polished. The top of the head has two linked perforations, which are well connected, but not perfectly aligned. The perforations were carefully drilled, and the circular striations created from the drilling process have been smoothed over. The edges of the perforations show moderate rounding, while rounding is also visible on the connecting wall between the two perforations. However, there are no distinctive traces usually associated with suspension (e.g. the presence of facets normally seen in suspension holes of ornaments, or areas with differential degree of polish the result of contact with the material used for suspension). The lack of these distinctive features, however, might suggest that the figurine was suspended for short periods of time not resulting in excessive use-wear traces.

On the torso, the area between the folded hands is pitted and rough (see Fig. 12). These irregularities, the result of shaping, are overlaid by polish (see below). The area around the folded arms is also rough and not well finished. The wrists are delineated by a fine incision that deepens and widens closer to the body. While details such as the four fingers and the thumb are indicated for both hands, the execution of the carving is not consistent (digits are not consistent in width, depth or length, while the thumb of the left hand, although incised, the incision was not deepened making it therefore visible only under magnification). The execution is not of high standard as interiors of the grooves are uneven with irregular striations visible. This lack of consistency is also encountered when comparing the sequence of actions for the carving of both hands. Contrary to what was observed in the manufacture of figurine 20736.x1, it appears that the manufacture of the second figurine lacks the recurrent and structured sequence in the incisions used to define its features (Figs. 14 and 15). The same inconsistency is visible in the carving of the ears. In this case while the overall idea is the same there is a lack of symmetry as the groove and the incision indicating the different features of the ear on one ear are deeper than on the other. The interior of the grooves and the area around the ears is not well smoothed over and multiple deep striations from the rough grinding still remain. Similarly, the unequal degree of finishing was attested in the area below the elbows (as seen from the back side of the figurine) with one side being rougher with visible facets suggesting an abrading action performed in different stages. There is a deep and wide groove with a well-smoothed interior that is only present on one side of the abdomen (see Fig. 12). The groove was created after the stomach was shaped and polished. The irregular character of this clearly noticeable groove looks rather misaligned and may represent a manufacturing error during which a disproportional groove was created and it could not be corrected without altering the form of the stomach completely (i.e. flattening of the stomach). The navel is an irregular concavity almost circular in shape that has no drilling wear, but was created by percussion.

The area between the lower parts of the legs, when seen from the back side, is flattened with rough-looking faceted areas. This suggests the gradual grinding and shaping of the surface while the presence of facets indicates less controlled and fluid movement. Both feet are polished, rounded and seem quite worn. Microscopically highly reflective polish is also visible on the back of the head, the back, buttocks, and thighs of the figurine. Based on the clear directionality of the polish (perpendicular to long axis) this would relate to the intentional modification of the surface during manufacture and not to subsequent handling of the figurine (in this case polish would have multiple and random directionality). Some possible indications of handling traces are visible, however, on the front side of the figurine, on the chest in the area between the two hands, and on the grooves indicating the pubic area/stomach. In the first case, polish overlays the pitted surface that relates to an earlier manufacturing stage. Polish development and grain morphology (i.e. rounded and not flattened grains) suggest contact with a soft, pliable material. In the case of the grooves delineating

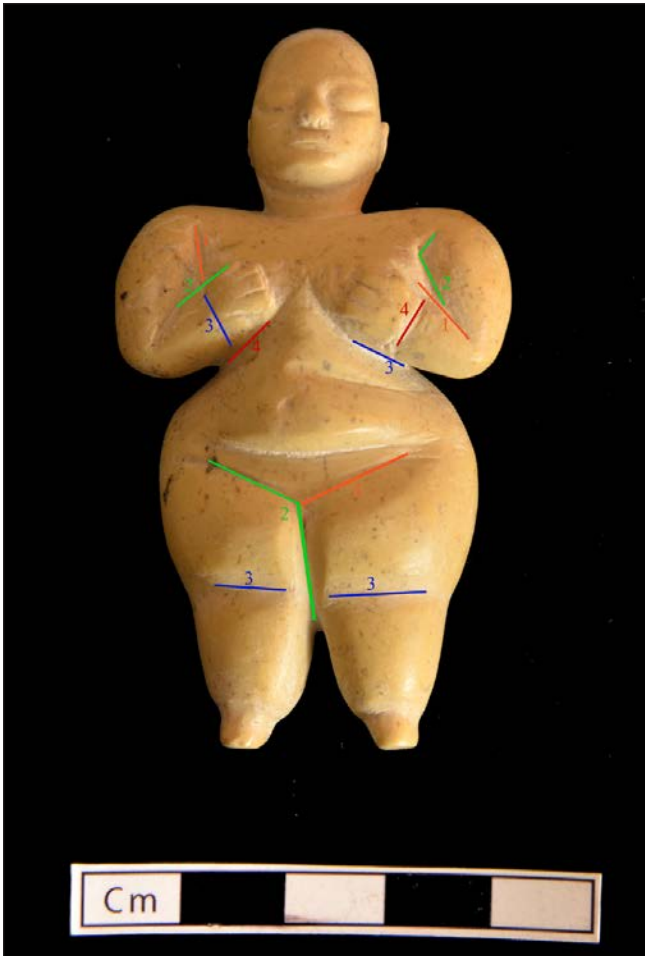


Figure 14. 20736.x3 (photo by Christina Tsoraki).

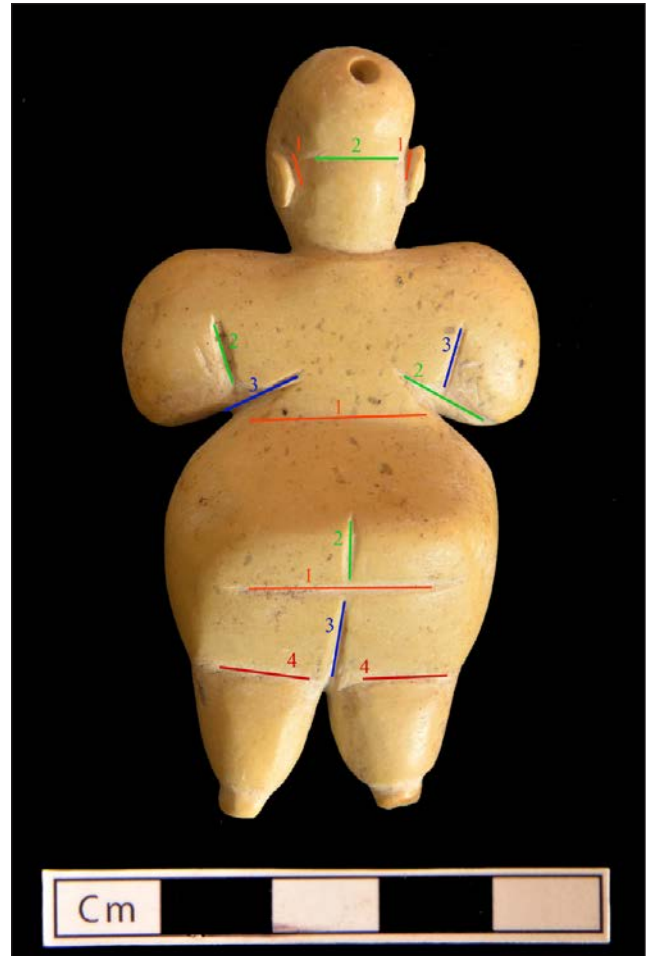


Figure 15. 20736.x3 (photo by Christina Tsoraki).

the pubic area/stomach area, these have rounded edges and worn appearance, most visible at the end of the grooves on either side of the body (see Fig. 12).

Similar to 20736.x1 the toolkit used for the manufacture would include thin-edge tools such as flint or obsidian blades that would allow for the execution of fine details. It is worth noting, however, that the piece of galena found next to this figurine has straight abraded edges, while one ridge between margin and body has intense chipping with unifacial irregular removals. Similar wear traces are encountered during contact against hard materials. The abraded edges of the piece have lost their shiny reflective appearance. Interestingly, similar traces of dull use-wear polish are observed on obsidian tools used against abrasive materials. It is therefore possible that this galena piece was associated with the manufacturing process of the 20736.x3. The overall form of the figurine was shaped by abrasion. The rough facets visible mainly around the ears, the neck and the shoulders suggest the use of quite abrasive materials.

Based on wear traces still visible on the surface of the figurine the following technological stages can be reconstructed:

1st stage: rough abrasion/grinding with abrasive materials. Facets with rough appearance were created during the grinding phase. The two perforations on the top of the head would have been drilled during this stage.

2nd stage: smoothing and polishing of the entire surface. This stage was accomplished by the use of progressively finer abrasive materials as suggested by the presence of very fine shallow striations mostly visible only under magnification.

3rd stage: creation of incisions and grooves.

4th stage: further polishing of the surface. After some of the incised features were carved, they were polished further.

Discussion

Both figurines are objects that required considerable time-investment in their production, as well as a degree of skill and knowledge of techniques and materials. While there are certain similarities in their posture (though when 20736.x3 is placed upright and observed from the back, the head is turning slightly to one side), differences are visible not only in the manner different anatomical features have been represented—particularly evident for the ears and the hands—but also in the quality of the finishing. Overall, the quality of the work and the care taken to finish 20736.x3 is considerably lower when compared to 20736.x1. This could potentially suggest that the maker was less experienced and perhaps less skillful. This is also indicated by manufacturing errors visible on 20736.x3. For example, the initiation of a fine, shallow incision can be seen next to a wider incision delineating the arm on the back side (see Fig. 13). The location and stage in the manufacturing sequence seems to suggest that this was a manufacturing error; the maker stopped working this incision soon after it was created, and continued with the incision of the arm in the area next to the first incision. The fingers also show some errors; incisions delineating the fingers were significantly longer when they were first incised suggesting misjudgment during the initial execution (see Fig. 12). The rather wide groove on the abdomen that looks out of place is perhaps another such example. No manufacturing errors or similar inconsistencies were observed on 20736.x1 in which good technical skill, attention to detail and in-depth knowledge are exhibited throughout the process of manufacture.

Beyond the different levels of skill displayed in the execution of individual features, there is also different degree of difficulty in the choice of the actual form of the objects. Figurine 20736.x1 is visibly more rotund with more pronounced areas of fat, particularly defining the breasts, stomach and legs, and as such its topography is exaggerated and more complex. These features, particularly their fleshy roundness, would as a result be harder to portray and the whole form of the figurine would be significantly harder to achieve.

It is interesting to note, however, the observed differences in the quality of the working of the different bodily features of figurine 20736.x3. The execution of facial characteristics such as the protruding eyes and nose (a more complex form and therefore technologically more demanding in terms of skill requirements) differs significantly from the level of skill shown in the execution of other bodily features such as the fingers/hands. This contrast in the exhibited skill and technique of working could potentially indicate that the different bodily features were shaped by different persons, one with visibly more experience (a master?) and knowledge, and another person with more limited knowledge (an apprentice?). If this holds true, then this figurine is a multi-authored object (Jones 2002: 94) that conveys a network of social associations potentially structured through learning processes.

Nakamura and Meskell (2009) have argued that bodily features that are typically drooping and flattened potentially indicate the aging body and could be associated with maturity. This is particularly interesting when considered in relation to the two figurines discussed here. A person

in a mature state of their life is often associated with increased experience, knowledge and skill-set. Interestingly, the two levels of skill identified on the two figurines seem to correspond with the potential different life-stages represented: 20736.x1, possibly representing a mature person, is associated with more skilled and knowledgeable working, while 20736.x3 depicting a female at an earlier stage of her life is associated with less skillful working. In that sense, the representation of age (or maturity) in figural form was accomplished not only through the form, but also through the manner of working. While this suggestion is based on the study of only two figurines, admittedly a very limited sample, the fact that these two objects were deliberately placed in close proximity to each other raises interesting questions about the meaning(s) conveyed through their deposition.

Finally, it is worth investigating further the differences in the degree of weathering between the two figurines. The presence of accretions and surface weathering on 20736.x1 may suggest that prior to its deposition under the platform it had been kept or even buried in a different environment that led to the formation of such deposits on its surface. In that respect, the figurine had potentially a more prolonged biography that included more than one depositional events.

Individual research projects

Several independent research projects have been underway in the last few years within the figurine team.

Figural and faunal visual expressions, temporal change, and social organization in the Neolithic (Lindsay Der)

Lindsay Der (2016) completed her doctoral research on the figural and faunal horns, tusks, and antlers excavated in buildings in the North and South Areas. Cranial appendages were chosen for analyses, given how prevalent they are in the figurine corpus and that these body parts are predominant in architectural installations and special deposits (Russell and Meece 2005: 219). Densities, frequencies, and diversity in taxa and figurine form were examined across space and time. The results reveal that although communities comprising the North and South Areas engaged in the production, curation, and circulation of horns, these practices display local variation. For example, in the middle Neolithic levels in the North, there is a significant statistical correlation between faunal and figural horn densities, particularly in unburned buildings. This is not the case in the South Area, where the cluster analysis on figural horn densities, faunal horn densities, and building burning has shown that houses that have been charred (B.76, B.79, B.80, B.97) sort into a discrete group. Such variation substantiates the notion that social organization at Çatalhöyük consisted of nested scales of social groupings consisting of households, corporate sodalities made up of multiple households, and the larger communities that made up the South and North Areas.

Results also align with the broader temporal changes that characterize the settlement in the middle levels. In this period, there is a clear and marked intensification in the deposition of horns, with the density of faunal horns climbing by 30% and figurines by 50%. Such a surge in deposition coincides with the adoption of domesticated cattle, which was likely delayed until this point in time due to the prominence of hunting across the economic, social, and ritual dimensions. After this point in time, there is a distinct shift toward domesticated animals in materializations and feasting. As well, a turn toward more portable art, like stamp seals and animal reliefs on pottery, parallels the way that domesticated cattle and herds of sheep and goat became a type of moveable property. Such a shift in emphasis from wild creatures to domesticates suggests a reconfiguration of ontological categories wherein wild animals became less like people and more like things. At

the same time, it paved the way toward incipient social inequality. Moreover, it corroborates other research (Marciniak and Czerniak 2007; Düring and Marciniak 2005) that contends households became increasingly autonomous in the later levels. The turn toward portable art and domesticated animals in visual expressions is a phenomenon observed elsewhere in the Middle East, suggesting Çatalhöyük is a participant in broader processes related to symbolism at the origins of agriculture (Helmer *et al.* 2004).

This research represents a preliminary investigation of cranial protrusions in materializations in the Neolithic Middle East. Future research would benefit from a comparison with depositions found outside the house, as well as inclusion of other excavation areas at Çatalhöyük. Additionally, plans for a future project include the examination of animal expressions at other sites stratigraphically sequenced with Çatalhöyük East, in order to better understand the correlation between symbolic practice and social differentiation.

Figurines as functional objects: researching markings to get to figurine production and use (Monique Arntz)

The main premise of this project is that the way forward in figurine research is to reconsider the importance placed on the representational qualities of figurines and instead focus on how figurines functioned within contextual settings. Figurines embody particular forms of engagement with the material world, and have material effects on the world through their social histories of production, use, exchange, and discard (Weismantel and Meskell 2014). To understand these aspects we thus need to engage with the material properties of figurines. The significance of figurines can be ascertained by researching the meaning within their production, use and discard.

Figurines must also be researched as functional objects. As functional objects they were made in such a way for them to perform their function in an optimal way. Choices within the production process were made towards optimising functionality working within the affordances and constraints offered by the material and techniques available, but probably also involved other social and symbolic considerations. Understanding these choices and how they affect the final product will not only give insight into the production sequence, but also into what qualities were deemed important for figurines to function properly. This will allow us to move beyond modern assumptions of technical efficaciousness (see for example Coupaye 2009 on ritual efficaciousness and Kuijpers 2014 on craft theory).

Project aims

This year's pilot study had as two main aims. Firstly, to determine what kinds of markings can be observed on figurines and, secondly to determine if they can be related to either the production or use of figurines, or, alternatively, if they are the result of post-depositional processes.

The primary source of information for this study was the existing figurine database. Furthermore, 180 figurines were subjected to detailed visual analysis: 106 zoomorphic figurines, 37 anthropomorphic figurines and 37 abbreviated figurines. Through the aid of macro photography detailed pictures of surface markings were obtained. RTI imaging was used on eight figurines. RTI imaging is a computational photographic method that captures a subject's surface shape and colour and enables the interactive re-lighting of the subject from any direction.

Types of markings

Ten different types of markings were identified on the analysed figurines; fingernail impressions, fingerprints, incisions, gauge marks, puncture marks, holes, dowel holes, impressions, polish/bur-nish and tool marks.

These markings can be identified easily on visual inspection. However, relating these markings as being the result of figurine production, use or post-depositional processes can be more difficult. Looking at figurine production, only fingerprints seem clearly related to figurine production. Finger impressions indicate where clay was moulded and pinched; sometimes these impressions still bare (partial) fingerprints. In other instances clay has been smoothed or smeared with fingerprints visible on these areas of smoothing (Fig. 16).

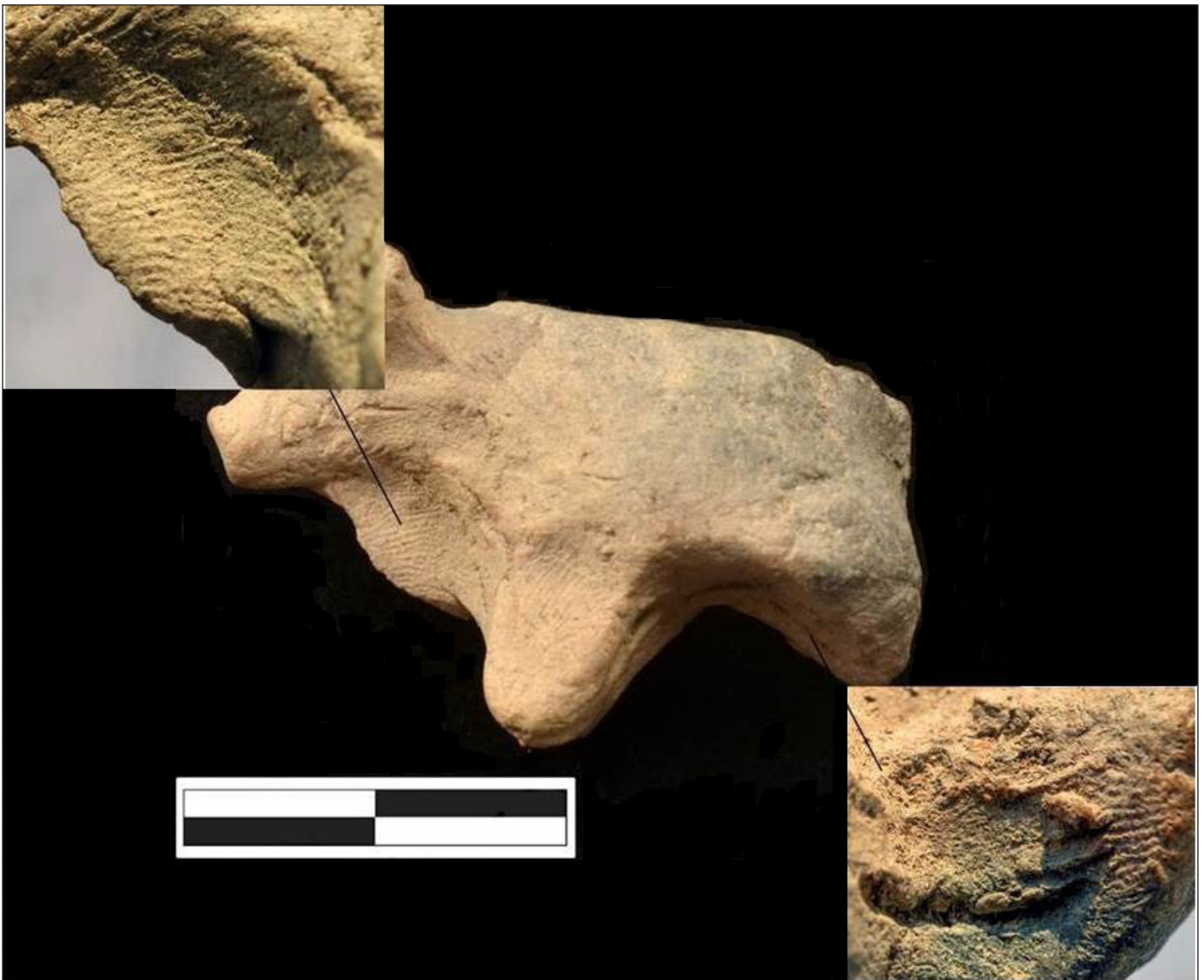


Figure 16. 18224.x?, zoomorphic figurine, showing fingerprint and fingernail impression (photos by Monique Arntz).

Fingernail impressions (see Fig. 16) are sometimes the result of the shaping process. Most notably on zoomorphic figurines fingernail impressions on curved surface and between figurine legs clearly are the result of shaping and smoothing of the figurines. However, fingernail impressions can be difficult to interpret. Some figurines have fingernail impressions on a flat, smooth surface,



Figure 17. 1590.xI, anthropomorphic figurine with incisions on bottom (photos by Monique Arntz).



Figure 18. 1590.xI, abbreviated figurine with holes possibly to indicate hair (photos by Monique Arntz).



Figure 19. 14183.xII, anthropomorphic figurine with dowel hole (photos by Monique Arntz).

with no obvious relation to the shaping or smoothing of the object. Incisions (Fig. 17) are sometimes used to indicate features such as facial features and limbs (incisions) and hair.

Holes sometimes appear to be decorative in nature, or alternatively, are used to indicate features such as hair and eyes (Fig. 18). Dowel holes are a special category, sometimes found on top of the neck at anthropomorphic figurines (Fig. 19).

Sometimes incisions and puncture holes seem to be related to the use of figurines. Surfaces are incised or punctured in a way that does not seem intended to either to indicate features or as decoration. Thus, perhaps we should interpret them as being related to the use of figurines. This use apparently involved altering the figurine in a way that, in some instances, comes down to 'disfiguring' the objects, sometimes almost beyond recognition. Gouge marks also fall into this category of markings related to figurine use. Sometimes gouge marks are visible on broken surfaces as if figurines have been intentionally broken (Fig. 20). Furthermore, some figurines were squashed and flattened when the clay was still plastic.



Figure 20. 7938.xl, zoomorphic figurine bearing puncture marks and gouges (photos by Monique Arntz).

All impressions different from finger impressions were recorded separately. There are several instances of foreign objects or materials having been pressed into the figurine's surface (Fig. 21). Impressions within fractured surfaces can also give information about inclusions as figurine 13161. H3 shows. This anthropomorphic figurine has a clear impression of a grain kernel on its fractured left side (Fig. 22).

Polish can sometimes be hard to distinguish from burnish. In a few instances clear burnishing marks can be seen, but mostly the figurines just show a distinct smooth and shiny surface. This polish is sometimes limited so certain areas on the figurine (Fig. 23). It is not always clear if polish was the result of the production process or the result of its use, e.g. continual handling.



Figure 21. 1832.x6, abbreviated figurine with impression (photos by Monique Arntz).

Finally, tool marks have been recorded as a separate category. These are very rare, but a distinct category of markings related to the production of figurines. Sometimes scrape marks show where clay was smoothed and/or removed. Distinct, triangular ‘scoops’ show where clay was removed in some instances. Besides markings we can distinguish different types of surface treatments. In the database this is recorded as a measure of smoothing of the object’s surface. Unlike markings, this measure of smoothing is in fact the degree to which markings have been removed. Some figurines are very well-smoothed leaving few clues to how figurines were made. Other surface treatments include the use of pigments or paint. This is a rare occurrence in this data set, but some examples do exist (see for example Fig. 24).

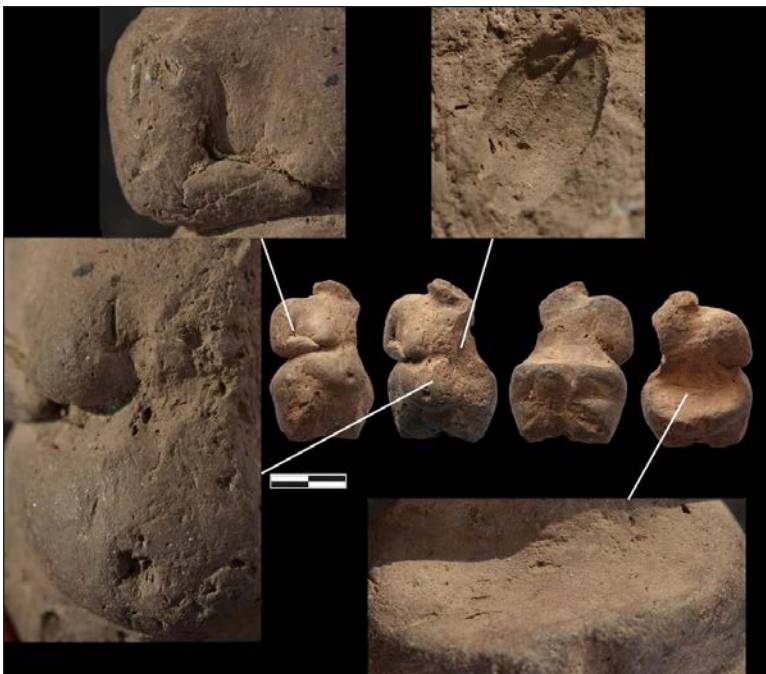


Figure 22. I3161.H3, anthropomorphic figurine with impression of grain kernel on fractured area. Smoothing marks on back. Hole to indicate navel (photos by Monique Arntz).

Another characteristic that offer insights into figurine production and use is whether or not they were exposed to fire or heat, and if so, in what manner. Establishing whether or not figurines have been exposed to fire or heat is not straightforward. It is even more difficult to infer the circumstances in which this occurred, as figurines are so seldom found *in situ* and predominantly in secondary refuse contexts. Most often we can only comment that figurines were burnt or baked. However, there are some instances where intentionality at least can be ascertained with a level of confidence. For example, there were a few examples where zoomorphic figurines were punctured and subsequently burnt on the punctured side (Fig. 25).



Figure 23. 17609.H1, anthropomorphic figurine with bur-nish and tool marks (photos by Monique Arntz).



Figure 24. 12524.H4, abbreviated figurine with paint traces (photos by Monique Arntz).



Figure 25. MELLETT.334.2, zoomorphic figurine with puncture marks and burning on one side (photos by Monique Arntz).

Markings: zoomorphic figurines

The dataset of zoomorphic figurines can be subdivided into three groups; bucrania (n=3), horn fragments (n=33) and quadrupeds (n=70) and fragments thereof. For analysis, bucrania and horn fragments will be grouped together (Table 1).

	Bucrania & horns	Quadrupeds
Fingernail impressions	13 (36.1%)	28 (40%)
Dowel hole	2 (5.6%)	2 (2.9%)
Hole	-	5 (7.1%)
Groove	-	1 (1.4%)
Gouge mark	2 (5.6%)	17 (24.3%)
Incision	2 (5.6%)	5 (7.1%)
Puncture mark	-	10 (14.3%)
Impression	1 (2.8%)	11 (15.7%)
Fingerprint	12 (33.3%)	23 (32.9%)
Polish	1 (2.8%)	6 (8.6%)
Scratch	2 (5.6%)	1 (1.4%)
Tool marks	3 (8.3%)	5 (7.1%)
Other	-	3 (4.3%)

Table 1. Types of markings on zoomorphic figurines.

A large percentage of zoomorphic figurines have markings; two of the bucrania, 22 of the horn fragments (both 67% respectively), and 58 quadrupeds (83%). The variety of markings is very great, most notably within the quadrupeds (see Table 1). Focussing on the quadrupeds, there is no strong correlation between the occurrence of different types of markings on figurines (see Table 2a and 2b). The exception is fingernail impressions and fingerprints that do occur quite often together. The horns and bucrania also show this correlation between fingerprints and fingernail impressions, which is most likely the unintentional result of shaping these small and detailed figurine parts.

Fingerprints and fingernail impressions are also the only two types of markings that occur with any frequency, the other types of markings only occurring once or twice. It is clear that the nature of

the markings is quite different, with horn fragments and bucrania showing markings related to the shaping of the objects and quadrupeds also revealing markings related to figurine use (Tables 2a and 2b).

	Fingernail impressions	Dowel hole	Hole	Groove	Gouge mark	Incision	Puncture mark	Impression	Fingerprint	Polish	Scratch	Tool marks	Other
Fingernail impressions		3.60%	3.6%	3.60%	25%	10.70%	17.90%	7.1%	35.7%	14.2%	0	10.7%	0
Dowel hole	50%		0	0	0	0	0	0	50%	50%	0	0	0
Hole	20%	0		0	0	0	0	20%	60%	0	0	0	0
Groove	100%	0	0		0	0	0	0	0	0	0	100%	0
Gouge mark	41.20%	0	0	0		11.8%	29.4%	23.5%	17.6%	5.9%	5.9%	5.9%	5.9%
Incision	60%	0	0	0	20%		20%	0	40%	0	0	0	0
Puncture mark	50%	0	0	0	50%	10%		20%	20%	0	0	20%	20%
Impression	18.2%	0	9.1%	0	36.4%	0	18.2%		18.2%	0	9.1%	0	0
Fingerprint	43.5%	4.3%	13%	0	13%	8.70%	8.7%	8.7%		21.7%	0	0	4.3%
Polish	66.7%	16.7%	0	0	16.7%	0.00%	0	0	83.3%		0	33.3%	16.7%
Scratch	0	0	0	0	100%	0	0	100%	0	0		0	0
Tool marks	60%	0	0	20%	20%	0%	40%	0	0	40%	0		0
Other	0	0	0	0	33.3%	0%	33.3%	0	33.3%	33.3%	0	0	

Table 2a. correlations types of markings in quadruped figurines.

The presence of markings does not seem to be related to clay fabric. The fabric of figurine with markings ranges from fine to rough, with most quadruped figurines having a fine (n=25, 43.1%), fine to medium (n=10, 17.2%), to medium texture (n=15, 25.9%). A similar spread of fabrics can be observed in quadrupeds without markings.

	Fingernail impressions	Dowel hole	Hole	Groove	Gouge mark	Incision	Puncture mark	Impression	Finger-print	Polish	Scratch	Tool marks	Other
Fingernail impressions		7.7%	0	0	8%	0.	0.	7.7%	23.1%	0	7.7%	7.7%	0
Dowel hole	50%		0	0	50%	50%	0	50%	0	0	0	0	0
Hole	-	-		-	-	-	-	-	-	-	-	-	-
Groove	-	-	-		-	-	-	-	-	-	-	-	-
Gouge mark	50%	50%	0	0		50%	0.	0	0	0	50%	0	0
Incision	0%	50%	0	0	50%		0	0	0	0	-	0	0
Puncture mark	-	-	-	0	-	-		-	-	-	0	-	-
Impression	100%	100	0	0	0	0	0.		0	0	0	0	0
Fingerprint	25%	0	0	0	0	0.	0.	0.00%		8.3%	0	16.7%	0
Polish	0	0	0	0	0.	0.	0	0	100%		-	0	0
Scratch	50%	0	0	0	50%	50%	0	0	0	0		0	0
Tool marks	33%	0	0	0	0%	0	0	0	66.7%	0	0		0
Other	-	-	-	-	-	-	-	-	-	-	-	-	-

Table 2b. correlations types of markings in horns+bucrania figurines.

When looking at horn fragments and bucrania, the picture is quite different as fabrics used for these objects are overwhelmingly (very) fine (n=21, 87.5%) for the objects with markings. The figurines with no markings show more diversity, ranging in fabric from fine (n=6, 50%), fine to medium (n=2, 16.7%), medium (n=3, 25%) to coarse (n=1, 8.3%) (see also Meskell 2007, 2008; Meskell *et al.* 2008).

The fingerprint and fingernail impressions found on zoomorphic figurines are likely all related to the production process, showing where the clay was pinched, moulded and smoothed. On eight fragments there are tool marks which in five instances consist of straight marks indicating where clay was smoothed and/or scraped. In two instances tools were used to remove clay, creating a triangular-shaped ‘scoop’, once under the tail and once between the hind legs.

Zoomorphic figurines are sometimes punctured and gouged. These markings mostly occur on the sides of bodies and necks, but there is no clear pattern in their placing. They were created by puncturing the still plastic clay with a round implement. There are exceptions where the puncture marks seem more deliberate in their execution and might possibly have been intended as decoration. In this dataset there is one such figurine, 7760.x2, a large quadruped (Fig. 26) that has puncture marks all over the left side of the body. The holes near the back are quite small, regular and quite deep. Above the left leg there are some holes that seem to have been made with a larger object and they are more skewed and sometimes very shallow. Interestingly, this figurine shows some black patches on the punctured side.

An uneven exposure to heat/fire is reported in ten zoomorphic quadrupeds of which one is a head fragment. In the other nine instances one side of the body seems more baked or burnt than the other. There is one more instance where the figurine is more burnt on its punctured side



Figure 26. 7760.x2, quadruped with puncture marks on left side of figurine (photo by Monique Arntz).

(999999.H27). This is certainly a very interesting observation. More research might reveal a pattern between puncture marks and heat exposure.

Markings: anthropomorphic figurines

Anthropomorphic figurines have been divided into (nearly) complete examples (n=2), and body – and head fragments (n=19 and n=14). Nearly all the anthropomorphic figurines have markings; only two body fragments have no markings on them (leaving 89%). The variety within markings are considerable, however most markings occur only once or twice (Table 3).

When looking at anthropomorphic body fragments incisions (n=9, 52.9%), polish and tool marks (both n=7, 41%), are by far the most common markings. In all but one instance incisions on anthropomorphic bodies are to indicate, or further emphasise limbs and buttocks. Tool marks, likewise, show where clay was removed to further emphasise limbs and shape. Furthermore, tool marks show where surfaces were scraped and smoothed, in one case clearly burnished. Nine pieces show polish, possibly as part of the production process or, alternatively, through continued handling. The gouge marks are predominantly located near the neck area – indicating deliberate removal of the head perhaps? Two dowel holes located at the top of the body perhaps point to removable heads.

When looking at the head fragments we again see that incisions and polish are quite common (n=5, 35.7%). By far the most common type of marking is holes (n=8, 57.1%). Again the holes and incisions are used to indicate facial features and possibly hair. In some instances it is not immedi-

	Complete	Body fragment	Head fragment
fingernail impressions	1 (50%)	2 (11.8%)	1 (7.2%)
Dowel hole	-	3 (17.6%)	3 (21.4%)
Hole	-	2 (11.8%)	8 (57.1%)
Groove	-	-	-
Gouge mark	-	5 (29.4%)	-
Incision	1 (50%)	9 (52.9%)	5 (35.7%)
Puncture mark	-	1 (5.9%)	1 (7.1%)
Impression	-	1 (5.9%)	2 (14.3%)
Fingerprint	-	1 (5.9%)	4 (28.6%)
Polish	1 (50%)	7 (41.2%)	5 (35.7%)
Scratch	-	-	-
Tool marks	-	7 (41.2%)	-
Other	-	-	2 (14.3%)

Table 3. Types of markings on anthropomorphic figurines.

ately clear if these incisions and holes/puncture marks are part of the production process and, if so, if they indicate features or should be interpreted as decoration. These markings do not seem to be related to their use. One of the examples, 5505.H7, is a piece shaped independently, which has 11 shallow holes on its left cheek and a vertical incision on its right. Although these markings are clearly intentional, their exact function is unclear (Fig. 27).



Figure 27. 5505.H7, anthropomorphic head with eleven shallow holes on the left cheek and incision on right cheek (photo by Monique Arntz).

In this study it became clear that anthropomorphic figurines are on the whole well smoothed and this is also reflected in the clay fabrics; they range from fine to coarse, but fabrics are predominantly fine (n=27, 73%).

Markings: abbreviated figurines

Out of the dataset of 37 abbreviated figurines examined, 18 (48.6%) have markings. These markings consist mostly of fingernail impressions (n=8, 44.4%) and fingerprints (n=9, 50%) (Table 4). The fingerprints on the abbreviated appear on different parts of the figurine, often between or on the legs, indicating how the legs were shaped. Likewise, some fingerprints are located on the folded head element where the clay was pinched and folded back. It is harder to interpret the fingernail impressions that appear on the smoothed bodies of these abbreviated forms. They do not appear to be an unintended outcome of the shaping process, but rather deliberately made in some instances.

	Abbreviated
fingernail impressions	8 (44.4%)
Dowel hole	1 (5.5%)
Hole	1 (5.5%)
Groove	-
Gouge mark	2 (11.1%)
Incision	1 (5.5%)
Puncture mark	1 (5.5%)
Impression	2 (11.1%)
Fingerprint	9 (50%)
Polish	4 (22.2%)
Scratch	-
Tool marks	1 (5.5%)
Other	-

Table 4. Types of markings on abbreviated figurines.

Fabrics are predominantly fine in this type of figurine (n=29, 78.4%) and they are well smoothed (n=20, 54%), in four instances possibly with polish or burnish. Notably, six figurines of this type have most definitely been exposed to fire in an uneven manner. It seems they were either placed in fire/exposed from heat standing up, with their bases and legs blackened. Alternatively, they are blackened along one side.

Difference in markings between figurine types

The markings vary considerably between the different types of figurines. Zoomorphic figurines have much more evidence of how they were molded, indicated by the finger impressions, finger prints and fingernail impressions. These markings were not smoothed away.

In contrast, anthropomorphic figurines are very well smoothed even when they are not polished or burnished as such. In essence the traces of their manufacture are erased. Anthropomorphic figurines have features indicated by incisions and holes in a way that zoomorphic figurines do not. Zoomorphic figurines, on the other hand, show more indications of their use, through the way they are punctured, gouged and incised.

Abbreviated figurines, like anthropomorphic figurines, are very well smoothed. Clues to their shaping are mostly in the form of fingerprints around the bases and folded head elements. The presence of polish and burnish on anthropomorphic and abbreviated shapes indicate two things. Firstly, they were better smoothed in the production process, and, secondly, they were possibly handled more and longer.

Shaping figurines

For each figurine a description was made detailing all observed details about their shaping. Can a *chaîne opératoire* be reconstructed for figurines? An exact reconstruction is very difficult; however there are certainly interesting observations to be made. First and foremost, it becomes clear that there is much variety within types and between figurine types. However, there are also some definite trends that distinguish figurine types from each other.

Figurines are either made as single objects or from composite pieces. Most often observed in zoomorphic figurines, pieces were shaped separately and then added on. It has been observed that legs, horns, tails and ears were added on, evidenced by (partial) seams and smoothing marks.

Alternatively, when the attached piece has fractured it can leave a distinctive concave fracture area. In anthropomorphic figurines tentatively, limbs are sometimes added as separate pieces, but this could not be established with absolute certainty. If they were added, they have been very well integrated into the main piece. In abbreviated figurines no evidence was found that pieces were attached. They seem to have been created from one piece of clay. On rare occasions zoomorphic figurines are composite pieces consisting of clay and other materials evidenced by one zoomorphic figurine had pebble inserted to indicate a tail.

Incising to indicate features is something reserved for anthropomorphic figurines only. Tool marks to smooth and shape clay is observed on zoomorphic figurines as well, but using implements to incise to shape or put extra emphasis on certain body parts is observed only on anthropomorphic figurines.

Smoothing surfaces was not so much of a concern with zoomorphic figurines, leaving many markings related to their shaping. As a contrast there is much more smoothing in anthropomorphic and abbreviated figurines.

Conclusions and avenues of further research

This study was a preliminary one and the case-study is quite small. Nonetheless, the initial results have been very encouraging. There are many markings and visual clues to the production and use of figurines. The key is to examine many figurines in order to establish patterns, or to see if the variety observed in this year's data set continues. Interpreting this variety is not straightforward; however I believe it points to individuality within figurine making. Even though there are certain types, or themes, within which figurines were shapes, there is much room for individuality in figurine making. This is expressed in the great variety in overall shapes, the way in which individual parts of figurines were shaped and the surfaces were finished.

Furthermore, even though markings can be sometimes difficult to interpret, there is scope to research intentionally in by carefully examining markings. By relating markings to either production or use it becomes possible to distinguish between markings that are the unintended result of manufacture and markings that are intentional; e.g. to indicate/emphasise features and decoration or part of their use.

I believe there are definite indications for different uses of zoomorphic figurines as opposed to anthropomorphic and abbreviated ones. Zoomorphic figurines at times seem to have been made with the purpose to be altered through them being punctured and gouged. Potentially, they were shaped, used and deposited. Anthropomorphic figurines are polished, sometimes burnished. Perhaps they were at times made with the aim of being in circulation for longer periods. The polish in some cases might be the result of this continued handling.

In future I would like to further incorporate more aspects figurine materiality; looking at the inclusions in clay, the fabrics and colours. Furthermore, I would like to focus on the baking and burning of figurines to see if certain markings can be related to this phenomenon, or if certain types are exposed to fire more often than others.

More contextual research could perhaps give insight into how and where figurines were exposed to fire. This is complicated by the fact figurines are most often found in secondary contexts. However, a more detailed study might reveal some clues. Other questions that we might answer through more contextual research concern differences between figurines at different locations on a household level and site level.

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Chapter 12

Chipped Stone from the North and South Areas

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Introduction

This report details the flint and obsidian artifacts from the 2016 field season. It largely focuses on the North Area by necessity, because this is where the majority of noteworthy deposits were located. Most of the material from the South Area was background noise, but the several interesting items recovered there are mentioned in some detail. Due to our early departure from site some of the heavy residue samples, particularly those from the South Area, were not able to be processed due to time constraints at the end of the season. This report includes all dry sieved and handpicked material that was washed and processed before July 23rd, which was my last day on site. It provides a general summary of the frequencies of chipped stone material recovered by building and space number (Table 1), as well as preliminary analyses of several significant deposits.

Building/Space	Area	Raw Material	Bulk Frequency	Bulk Weight (g)	HR Frequency	HR Weight (g)
Sp. 85	North	Obsidian	427	294.4	2843	74.72
Sp. 610	North	Obsidian	1044	455.36	464	20.74
B. 5, Sp. 154	North	Obsidian	12	61.55	68	1.1
B. 129, Sp. 77	North	Obsidian	22	19.5	0	0
B. 131, Sp. 500	North	Obsidian	57	172.6	325	19.89
B. 132, Sp. 531	North	Obsidian	102	96.1	619	24.19
B. 77/114/131, Sp. 85/87/336/500	North	Obsidian	13	3.9	0	0
Sp. 553	South	Obsidian	1	0.3	30	1.01
Sp. 583	South	Obsidian	73	89.7	1865	101.08
Sp. 601	South	Obsidian	0	0	6	0.27
Sp. 606	South	Obsidian	9	11.9	0	0
B. 6, Sp. 173	South	Obsidian	7	6.4	0	0
B. 17, Sp. 170	South	Obsidian	25	38.1	18	48
B. 43, Sp. 600	South	Obsidian	3	5.7	0	0
B. 80, Sp. 135	South	Obsidian	11	18.5	41	2.36
B. 89, Sp. 379	South	Obsidian	0	0	5	0.17
B. 89, Sp. 565	South	Obsidian	42	17.4	100	4.48
B. 118, Sp. 510	South	Obsidian	13	39.8	134	4.22
B. 160, Sp. 551	South	Obsidian	9	18.1	966	39.45
B. 160, Sp. 552	South	Obsidian	6	5.8	52	1.02
B. 161, Sp. 605	South	Obsidian	32	51.9	0	0
Totals			1908	1407.01	7536	342.7
Sp. 85	North	Flint	11	34.7	64	19.02
Sp. 610	North	Flint	12	10.5	15	0.4
B. 5, Sp. 154	North	Flint	2	43.8	5	0.1
B. 131, Sp. 500	North	Flint	7	32.8	4	1.7
B. 132, Sp. 531	North	Flint	3	14.1	10	0.36
B. 77/114/131, Sp. 85/87/336/500	North	Flint	1	0.6	0	0
Sp. 553	South	Flint	1	0.5	10	0.14
Sp. 583	South	Flint	3	6.6	50	8.47
Sp. 606	South	Flint	1	3.8	0	0
B. 17, Sp. 170	South	Flint	1	28.6	0	0
B. 80, Sp. 135	South	Flint	0	0	3	1
B. 118, Sp. 510	South	Flint	2	3.1	3	0.15
B. 160, Sp. 551	South	Flint	2	14.2	42	6.23
B. 160, Sp. 552	South	Flint	1	3.9	4	0.16
B. 161, Sp. 605	South	Flint	6	12.3	0	0
Totals			53	209.5	210	37.73

Table 1. All obsidian and flint material recovered and catalogued in 2016, separated by retrieval method (bulk is from dry sieve and hand picking, HR is heavy residue), and listed by frequency and weight.

North Area

Spaces 85 and 610

Space 85 was designated to layers of the external area located east of B.131 and north of B.114 that post-dated the construction of B.129, which is evidenced by the presence of a foundation trench excavated for that construction episode, while Sp.610 represents the layers that predated this construction. Not surprisingly, these spaces offered up the majority of chipped stone material recovered in 2016, with 76.2% (1,494/1,961) of all dry sieved and handpicked finds, and 43.7% (3,386/7,746) of all heavy residue.

Excavated in a grid by Justine Issavi, both Spaces 85 and 610 provided lab specialists with an interesting view into the organization of midden accumulation at Çatalhöyük, as we were able to analyze and compare different 1 x 1m squares of these external spaces at a higher resolution than was previously possible. One pattern that has emerged from this strategy shows that higher densities of chipped stone were recovered from the units adjacent to the walls of the surrounding buildings, whereby it is suggested that basket loads of waste material were dumped from the roofs of these buildings, resulting in higher elevations around the perimeter of the external area and a slumping of the layers closer to the center.

Within the layers of these midden accumulations were several fire spots and ashy deposits that contained highly variable densities of chipped stone, though technologically speaking they were remarkably similar. For example, the heavy residue samples from an ashy deposit (32107) in Sp.85 had over 16 pieces per liter, while the samples from fire spot (32111) in Sp.85 all had less than three pieces per liter. In all instances the obsidian was predominantly from Göllü Dağ (80% or more) and consisted of almost entirely biface thinning flakes and debris from the low-skilled percussion industries characteristic of the earlier levels, alongside several flakes and blade-like flakes with unmodified used cutting and scraping edges.



Figure 1. Small obsidian projectile from Sp.610 (32114).

A small complete projectile (Fig. 1) was recovered from dry sieved Sample 119 of (32114), a charcoal-rich dumping layer within Sp.610. Produced on Göllü Dağ obsidian and measuring only 3.8cm long, it closely resembles a Conolly Type 11 point (Conolly 1999: 39), but could perhaps be the reworked tip of a larger, broken projectile as the tang looks more hastily and asymmetrically worked

than the rest of the piece. It is peculiar that this complete projectile was recovered from a midden context, as the majority of finds from such units are usually fragmented and no longer functional without reworking. This arrowhead could easily be hafted and used again without any further modification, and thus it seems appropriate to hypothesize that this object might have entered into the midden still embedded within the animal it was used to kill, or perhaps it was misplaced and accidentally thrown in with a basket load of charcoal-rich waste never to be seen again by its Neolithic owner.

From flotation Sample 2 of the fire spot (32115) in Sp.610 there was a fragment of an obsidian bead, a very rare occurrence indeed. The source of this obsidian is unknown to the current visual characterization scheme at Çatalhöyük, but perhaps originated from Bingöl B, a volcano located over 600km away in Eastern Turkey. This hypothesis is put forth due to its complete opacity even at such a small size and thickness (approximately 4mm wide and 1mm thick), and its rough matte surface. These attributes mark it as something different than the Type 18 'opaque black shiny' obsidian we know of from East Göllü Dağ (Milić *et al.* 2013), which at such a small size should still allow a small amount of light through the margins.

Building 5, Space 154

Although the only contexts excavated in B.5 this year were several burials, one of them contained the most spectacular assortment of materials I have personally witnessed at Çatalhöyük (Fig. 2). Burial fill (22194) contained four exquisite projectiles, while the associated skeleton (22196) had two large flint prismatic blades associated with it. One of these blades was produced via indirect percussion from a prepared core and had been heavily used and retouched continuously along the edges. The other was a highly standardized prismatic blade with a trapezoidal cross-section, and could only have been produced via a lever-induced pressure technique from a large prepared bullet core, likely off-site and imported as a prestige item. It was very lightly used and had only linear denticulated retouch continuously around all edges.



Figure 2. In situ photograph of four obsidian projectiles from B.5, Sp.154 burial fill (22194) and the lever-produced flint prismatic blade visible with Sk (22196).

The obsidian projectiles were clearly produced by master knappers, and it is tempting to state that they were manufactured for the sole purpose of being interred within this burial. They are sharp, fresh, and without any use-wear traces (Alice Vinet, pers. comm.), suggesting a role as purely ceremonial objects. Oddly, the tang of one of these projectiles was found embedded through the underside of the wooden object upon which the skull of the skeleton was found, approximately 40cm away.

Building 131, Space 500

Building 131 contained only 3.3% (64/1,961) of all bulk finds and 4.2% (329/7,746) of all heavy residue material from the 2016 chipped stone assemblage, but it contained several interesting items. One noteworthy context was a potential small obsidian cache located in the fill of a small cut (32536) underneath the burnt earliest floor of the building (Fig. 3). While many obsidian caches found at Çatalhöyük contain relatively unworked thick and often cortical quarry flakes, or conversely finished and complete projectiles, this one falls somewhere in the middle. It consisted of two large biface preforms, with (32536.x1) weighing 47 g and (32536.x2) weighing 92.4 g. Their ventral surfaces remained largely flat and unworked, while their dorsal surfaces had several flakes taken off to roughly shape the preforms for transport from the quarry to site, where they were quickly interred as a form of accumulated wealth or foundation deposit during a rebuilding episode of this building.



Figure 3. Two obsidian biface preforms in situ from B.131, Sp.500 (32536).

Building 132, Space 531

Containing 5.4% (105/1,961) of all bulk material and 8.1% (629/7,746) of all heavy residue recovered in 2016, B.132 was an intricate web of myriad feature types. A cluster of objects (31585) within a pit in the northeast corner of the building comprised several different material types, including an interesting assortment of 32 obsidian artifacts. Of these, one was a small exhausted core made on Nenezi

Dağ obsidian that had been split in half and reworked as a *piece esquillee*, a type of wedge used for splitting bone or wood. The remainder of the pieces were all from Göllü Dağ and made up of several different tool types, including a right angled plane scraper with a perforator tip, several multi-edged cutting implements, and a double side and end scraper. The rest were biface thinning flakes that did not seem to refit onto each other, although a more systematic effort might prove otherwise.

Unit (31596) was the fill of a small scoop in the southwest corner of the building, at a depth of 17cm. The entire volume of this fill was sent to flotation, which provided a heavy residue sample density of 3.5 obsidian pieces per liter of soil. All of these were irregular looking flakes from Göllü Dağ that looked like they could have been knocked off from the edges of quarry flakes or biface preforms while being transported in a bag from the quarry to site. This led me to suggest that this scoop was an obsidian hoard that was excavated and retrieved some time before the abandonment of B.132, with the unwanted flakes and shatter left *in situ*.

A dirty floor (31540) was excavated in a grid with 1 x 1m squares, and provided a unique look into its makeup and the differential distribution of artifacts within it. Each grid square contained artifacts typical of a dirty floor, mostly flake fragments and bits of shatter primarily of Göllü Dağ obsidian, but the real prize of this strategy was in how widely the heavy residue volumes differed between them. The three units closest to the southeast corner of the building contained 6.8, 8 and 14 pieces per liter of soil, while those closer to the center all had less than three pieces per liter, with the majority of them below one piece per liter. This suggests either that most flintknapping events occurred in the southeast corner, or at the very least that most of the debris was swept into this corner to be collected and thrown out later but had been trampled or pressed into the fabric of the dirty floor before this occurred.

South Area

Space 583

This space number was designated to two midden deposits that abutted the north side of B.43, and are perhaps stratigraphically equal to the 'courtyard' of Sp.115. Interestingly there is some disparity between the number of bulk and heavy residue finds recovered from this space, as the bulk represents only 3.9% (76/1,961) and the heavy residue 24.7% (1915/7,746) of the 2016 assemblage. This can perhaps in part be explained by the fact that many of these units were disturbed by excavation in the 1960s, during which many of the larger pieces would have been winnowed out and the smaller pieces returned with the backfill, but regardless it is something to look into further in the future.

Building 17, Space 170

Recovered from the fill of a cut (21862) related to domestic activities within B.17 was a perfect example of an opposed platform blade-like flake percussion core typical of the earlier levels of Çatalhöyük (Fig. 4). Finding a core of this size is very rare, only evidenced by their related blade-like flake blanks that are used without any modification, as most of them are reduced down to exhaustion and often turned into a *piece esquillee*. This core has some quarry patina on the dorsal surface, suggesting it is still early in its use-life and not far removed from the quarry flakes that enter the site as raw material. It is clearly not a biface preform as there are no flake removals from either side, but only from the proximal and distal ends using a relatively low-skilled percussion technique.



Figure 4. Opposed platform percussion blade-like flake core from B.17, Sp.170 (21862).



Figure 5. Ventral face of Can Hasan III inscribed point with 'X' marking from B.160, Sp.551 (32492).

Building 160, Space 551

One of the more exciting chipped stone finds of the 2016 season came in the form of what is arguably a Can Hasan III inscribed point (Fig. 5). Found on a floor surface (32492), it was made on a standardized percussion blade, heavily and continuously re-touched along both edges on the dorsal face, with some marginal retouch on the ventral, and had both its tip and base deliberately snapped off some time prior to deposition. On the flat ventral face there is a clear inscription in the form of an 'X', likely produced with the thin sharp edge of a harder stone material. Each line of the 'X' is made up of three individual incisions. This is the fifth Can Hasan III inscribed point found at Çatalhöyük, with the first four recovered in previous years from the following contexts: two from Level South G middens (Carter *et al.* 2005: 277), one from a Level North H midden (14931.A1), and the last from the upper part of Trench 7 on the West Mound (15101.A28) (Carter and Milić 2013: 454). The designs on such tools are believed to refer to a specific hunter or event (Ataman 1986), and potentially provide evidence for the long-term curation of heirloom items that invoke memories or stories of a particular ancestor or community member.

Another peculiar deposit from this building was a ring of both ground and chipped stone tools from dirty floor (32453) intentionally placed around a ladder installation and covered over, possibly related to a rebuilding episode of the building's southeast corner. These tools all seem to have undergone a quite extensive use-life, with several episodes of use, breakage (either intentionally or as a result of being used) and re-use as different tool types. The chipped stone component was made up of a thick flint indirect percussion blade that was used and then repurposed into a *piece esquillee*, a thick round flint flake that was broken in half after being used and heavily retouched as a cutting implement, a Göllü Dağ exhausted blade core that was split in half and used as a *piece esquillee*, and the rounded base of a Göllü Dağ projectile made on a thick triangular blade that does not appear to have been reused after it was broken.

Experimental flintknapping project

This season I began an experimental flintknapping project with two objectives in mind: (1) to produce a comparative collection of debris by replicating several technological industries from Neolithic Çatalhöyük to compare against the archaeological assemblage, and (2) to produce a range of tools that would be used for several butchering and use-wear projects planned for this year and next. Only materials that would have been available during the site's occupation were used to achieve these objectives, including stone and deer antler hammers and a hardwood mallet for percussion, deer antler tines for pressure flaking, along with poplar wood for constructing the chest crutch that I used to produce prismatic pressure blades. The results from the initial stages of this project have thus far been promising, encouraging its expansion and continuation in the future.



Figure 6. Ovoid biface preform replica produced using direct percussion.



Figure 7. Projectile replica produced using indirect percussion and sharpened via pressure flaking.

The first stage involved using bifacial technologies to replicate several preforms and projectiles that have been recovered from the archaeological assemblage. Using a soft sandstone hammer and direct percussion I produced a rough ovoid biface preform (Fig. 6) fashioned after one found in Sp.99 in 2014. Next I produced another preform using the same methods, and then switched to an indirect percussion technique using an antler punch and wooden mallet for the final thinning and shaping stages. Finally I shaped the tang and sharpened the edges using an antler tang to produce the finished tool (Fig. 7).

For the second stage I delved into prepared core technology, using the sandstone hammer to rough out a blade core preform. This was placed into a hollowed out log to stabilize the core. Down the side of the log was a slit to allow the blades to release cleanly. I then used the chest crutch, which had an antler tip that came in contact with the core platform, to peel off a series of prismatic pressure blades from the core (Fig. 8). The primary series blades were fairly thick and irregular as they did not have good straight ridges to follow, but as I got going the blades became more thin and standardized, with the late stage blades exhibiting straight, parallel edges and a trapezoidal cross-section. These experiments provided valuable insight into the nature of the archaeological assemblage, particularly in differentiating biface thinning flakes from core shaping and platform rejuvenation flakes. Once I was satisfied that the tools I had produced closely resembled the artifacts I had aimed to replicate, it was time to move onto the experimental butchering and use-wear section of the project.



Figure 8. Prismatic pressure blade core replica, pictured after the series of primary blade removals.

Experimental butchering project

The first of several planned butchering and use-wear experiments involved the butchering of a goat purchased from a farmer located in the local village of Küçükköy, who also works at Çatalhöyük as one of the excavation workmen. The goat was brought onto the site and slaughtered by the farmer, as we wanted the deed to be done properly and without any needless suffering to the animal, and none of the participants were yet comfortable to do it ourselves. Once we were sure the goat had passed on, and after several respectful moments of silence to thank the animal for its contribution to our cause and to appreciate the value of its life, it was strung up by its ankles to be bled properly, and then the experiment began in earnest. All the flakes, blades and tools used for this task were knapped by myself on site, and the entire process was diligently recorded by Alice Vinet, who was

the use-wear analyst present on site this year. Alice created and filled out the recording sheets used for this experiment, and made sure to ask for details from each person while they used the tools and after their task had been completed.



Figure 9. Fats and other residues are removed from the stretched hide using an obsidian scraper.

Once the goat had been butchered, the hide was left to soak in a mixture of water and wood ash for two days. Afterwards, it was attached to a hide stretcher constructed using four poplar poles tied together to make a square shape. Two scrapers made on thick overshoot blade core rejuvenation flakes were used to scrape off the fat and other material until all that was left was the skin (Fig. 9). This dried quickly and became a rawhide that could then be used for a variety of purposes, and will be utilized in future experiments.

Updates to the chipped stone database

My objectives for this season, and next year's study season, involve collecting as much data as possible on a large number of units, which required several small but important changes to the chipped stone database in order to maximize the amount of time and energy spent recording the artifacts from these units. The Level One database remained unchanged, but Level Two analyses have now been split into Stage One and Stage Two.

Stage One of the new Level Two database involves the separation of each piece of non-diagnostic and unused chipped stone from any unit into their main source groups. For the flint products this is done based on the color and quality of the material, while the obsidian products are separated into their main source groups using the visual characterization scheme long established and well utilized at Çatalhöyük (Milić *et al.* 2013). These groups are then categorized by their blank type, and recorded together as groups. As the majority of chipped stone from any unit comprises these types of artifacts, this saves a tremendous amount of time and still records the important source and technological attributes of the assemblage.

Stage Two is very similar to the original Level Two database, but again economizes the time and energy spent on any one piece, while recording as many attributes as possible in order to compile a standardized spatial and diachronic pool of information that can still be appropriately compared to any material recorded using the original Level Two database. All changes made to this stage of analysis were done to make the process more user-friendly and more reliable when quickly moving through and recording as many units as possible. The primary attribute fields generally remained the same as in the original Level Two database, but the options were expanded to include more technological and typological variability and to make the data more easily queryable.

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Chapter 13

The Chipped Stone from Trenches 3 and 4, TPC Area

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Introduction

The 2016 study period, for the chipped stone from TPC Area, was unfortunately restricted to only two weeks. During this time, two major tasks were performed: (1) registration of chipped stone retrieved during the 2016 excavation, and (2) an in depth attribute analysis of chipped stone from selected units of trenches 3 and 4 in the TPC Area, excavated between 2013 and 2016.

The following report presents the chipped stone material from selected units of trenches 3 and 4 in the TPC Area, excavated between the years 2013-2016, and studied in July 2016. The report includes a general techno-typological presentation of the studied material combined with discussion of some broader questions including technology, skill, intensity of use, etc.

The selected assemblage includes 468 items, derive from 40 units (64 bags), retrieved by dry sieving or hand picking. 1.7% of the items are made of flint (N=8) and 98.3% are obsidian (N=460). Of these, 28 obsidian items originate in post-Chalcolithic contexts (six units) and will be mentioned separately when relevant.

Flint

The eight flint items include one tabular knife or scraper, a miniature core-on-flake, a core platform preparation flake, and several rolled and/or patinated chips and chunks, two of which may have been tools. The raw materials are all fine grain, transparent to semi-transparent, and range in color from orange and yellow to grey and milky-white.



Figure 1. (left) Flint tabular scraper; (right) detail of oblique and transverse striations on the cortex of the scraper.

The tabular knife (Fig. 1a) is made on a slab of fine grain, dark brown, tabular flint, with chalky cortex on both faces. It has a rectangular outline shaped by bilateral bifacial retouch. The retouch is semi-abrupt and quite short, exposing only a few millimeters of the flint and ending in multiple hinge and step terminations on the chalky cortex. One lateral has continuous retouch yet the other lateral has retouch starting at both ends but not reaching the middle, leaving an unretouched part of the lateral edge. This unretouched part retains a patinated break or natural edge of the slab. The item measures L-7.5cm, W-5.2cm, T-8.7cm, and weighs 62.5g. Tabular knives are well known from Neolithic sites in the southern Levant (Dag 2008: for definition: pp. 123-130, for comperanda: p. 176)

The cortex of the knife is mostly scrubbed flat. Oblique abrasion striations are apparent on the cortex of both faces. It is uncertain if they were produced during manufacture (smoothing of the cortex while shaping the tool), or use. It is possible that the cortex was used as an abrasion tool, for polishing or grinding, while the flint was used as a cutting\scraping tool – thus utilizing both raw materials and the different characteristics each raw material has. On one face of the knife there are deeper and cruder transverse striations postdating the oblique abrasion striations (Fig. 1b). On the other face there are irregular polished spots – again, it is uncertain if they were produced during manufacture (to facilitate the tool style or grip) or incidental during handling (Tsoraki, pers. comm.).

Obsidian

Raw material sourcing

The Neolithic assemblage includes 432 items. Visual characterization (Milić *et al.* 2013) sources them mainly to the Cappadocian Nenezi Dağ (77%) and Göllü Dağ (22%) sources, with single items from the Eastern Anatolian Bingöl (1%) source (Fig. 2). Within Göllü Dağ, a distinction could be made between Kayırlı and other local outcrops.

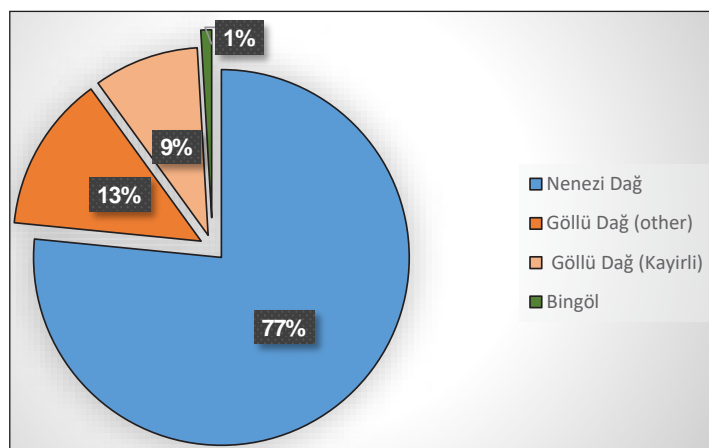


Figure 2. Source distribution of obsidian from selected Neolithic contexts in TPC Area (N=432).

lithic layers at Çatalhöyük (Carter 2011), is also reflected in the small Post-Chalcolithic assemblage from TPC Area (Table 1).

Four blade fragments on obsidian from east Anatolian Bingöl (Carter *et al.* 2008) were found in Sp.578 (units 31807; 31361; 31827). They all seem to be fragments of the same blade, though they do not exactly refit. They will be excluded from further counts, concentrating on the comparison of Nenezi Dağ and Göllü Dağ.

A shift in source exploitation at Çatalhöyük is apparent between Levels South N-P (Carter and Milić 2013: 434, Fig. 21.2a) with a clear demise in obsidian from Göllü Dağ, and a rise in obsidian from Nenezi Dağ. The earlier levels (before South N) contain more than 80% Göllü Dağ material, while later levels (after South P) contain less than 20%. The distribution of the TPC Area material, which is presumably contemporaneous with the later levels of the South Area sequence (Marciniak 2015), reflects the trend of the later levels. The possible shift back to greater exploitation of Göllü Dağ sources, as seen in the later Chalcolithic layers at Çatalhöyük (Carter 2011), is also reflected in the small Post-Chalcolithic assemblage from TPC Area (Table 1).

Source	Nenezi Dağ	Göllü Dağ (other)	Göllü Dağ (Kayirli)	Bingöl	total
No. of items	19	2	7	0	28
%	68%	7%	25%	0%	100%

Table 1. Source distribution of obsidian from selected Post-Chalcolithic contexts in TPC Area.

Production technique	N	%
pressure blade/let	240	56%
pressure core	1	0%
total pressure	241	56%
percussion blade/let	25	6%
percussion flake	114	27%
percussion core	3	1%
total percussion	142	33%
mixed core	5	1%
indirect percussion	15	4%
hammer and anvil	9	2%
shatter	6	1%
n/a	10	2%
total	428	100%

Table 2. Different production techniques found in TPC Area.

Production technique

The dominant obsidian production technology in TPC Area is pressure-flaking, used to produce blades and bladelets. Nearly 60% of all items found were produced by pressure (Table 2) – including blade/lets and their cores. This percentage fits with the results for the contemporary upper layers of the South sequence (Carter and Milić 2013: 429, Fig. 21.13).

The method of producing blades by pressure involves more than the exertion of pressure alone (Pelegrin 2012). It requires, for example, repetitive striking platform maintenance – removals which were performed by percussion – to facilitate further production by pressure. In order to achieve a more inclusive understanding of the intensity of use of this technology we should therefore move about 50 such items (see below in the section about core trimming elements (CTEs)) from ‘percussion’

to ‘pressure’, raising the use of pressure-related-procedures in TPC Area to 68%. It is most probable that additional percussion-produced items are actually related to the general procedure of pressure production, presumably raising the percentages of this industry even more.

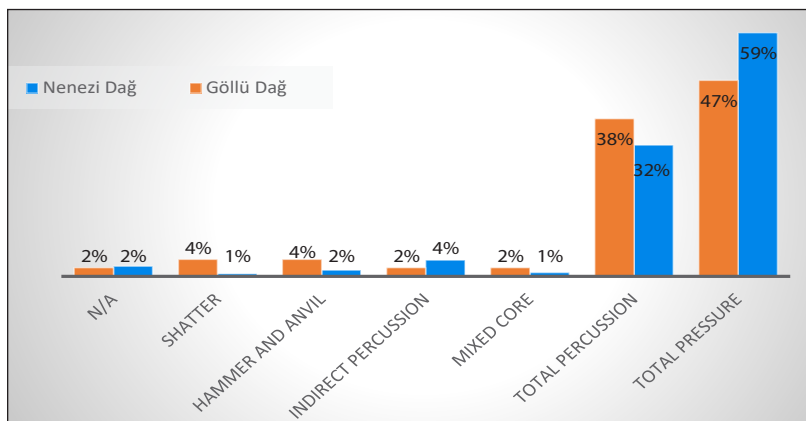


Figure 3. Comparison of different production technique frequencies between the different sources.

Comparing the use of different production techniques between obsidian from different sources, it is apparent that pressure is more common on the items from Nenezi Dağ, where indirect percussion is also slightly more common, while percussion is more common on items from Göllü Dağ, where higher percentages of ‘hammer-and-anvil’ and shattering are also apparent (Fig. 3).

Technology

The breakdown of debitage types from the selected Neolithic contexts in the TPC Area may highlight several aspects of production and use (Fig. 4). We will review them following the steps of the *chaîne opératoire*.

Primary elements, those items carrying cortex or the outer surface of an obsidian nodule, are practically absent (one item was found). This means that the initial shaping of the core was performed elsewhere, and that cores reached the site pre-formed and “ready to go” (Carter 2011; Carter and Milić 2013: 443). However, several items have what seem to be natural, mirror-flat surfaces on the dorsal face, meeting at quite an accurate right angle, creating a natural, unshaped (though sometimes abraded) ridge (e.g. a bladelet (31850); a core platform preparation flake (31848); both from Nenezi Dağ). These surfaces are very flat, without ripples or cracks, and seem to be covered by a clear, thin, ‘nail-polish’ patina. I tend to believe that these surfaces represent outer surfaces of obsidian blocks or slabs broken off at the source, sometime before collection. This type of items are known from the southern Levant as well, where cores were also usually brought “ready-made” to the site (Gopher *et al.* 2011; Schechter *et al.* 2013, 2016). This may mean that at least some blocks were brought unshaped to the site.

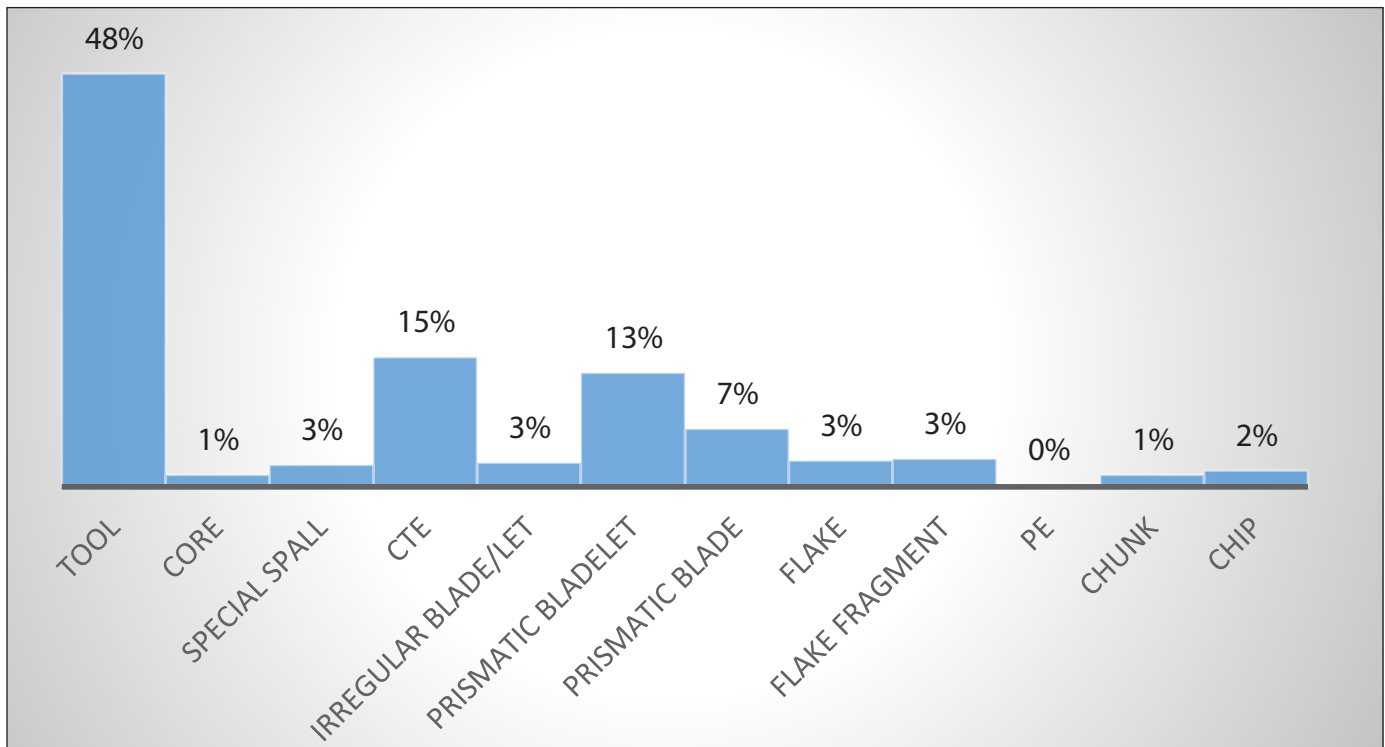


Figure 4. Debitage class frequencies from selected Neolithic contexts at TPC Area (N=428).

Additionally, several items have polish or abrasion on their dorsal arrises, which may have been caused by rubbing, perhaps against a wrap of some sort, during transport. They thus also represent the very initial stages of on-site reduction from the core. These items include: a retouched blade and a core platform preparation flake (31850), both from Nenezi Dağ; a blade and a core platform preparation flake (31848), both from Nenezi Dağ; a retouched blade from Göllü Dağ (31361).

Prismatic blades and bladelets, the product of the pressure industry, were the desired blank, and make up 20% of the assemblage.

Intensive core shaping and maintenance is needed during the process of pressure production (Pelegrin 2012) as is reflected in the high frequency of CTEs (15%). Different types of CTE were found in trenches 3 and 4, typical to the pressure bladelet production industry (Fig. 5). We noticed a distinction between core platform rejuvenation and preparation flakes – the former are complete removals of the striking platform while the latter are partial. The preparation flakes far outnumber the complete removals (34 vs. 5 from Nenezi Dağ and 10 vs. 4 from Göllü Dağ). There generally seems to have been more striking platform maintenance on the material from Nenezi Dağ (81% vs. 64%), compared to more use of overshots on the material from Göllü Dağ (14% vs. 4%). The ‘Other’ category is eclectic, including transverse removals of parts of the debitage plane, removal of different disturbances, and removals maintaining debitage plane curvature. In most cases, particularly with core platform maintenance flakes, CTEs were removed by direct percussion.

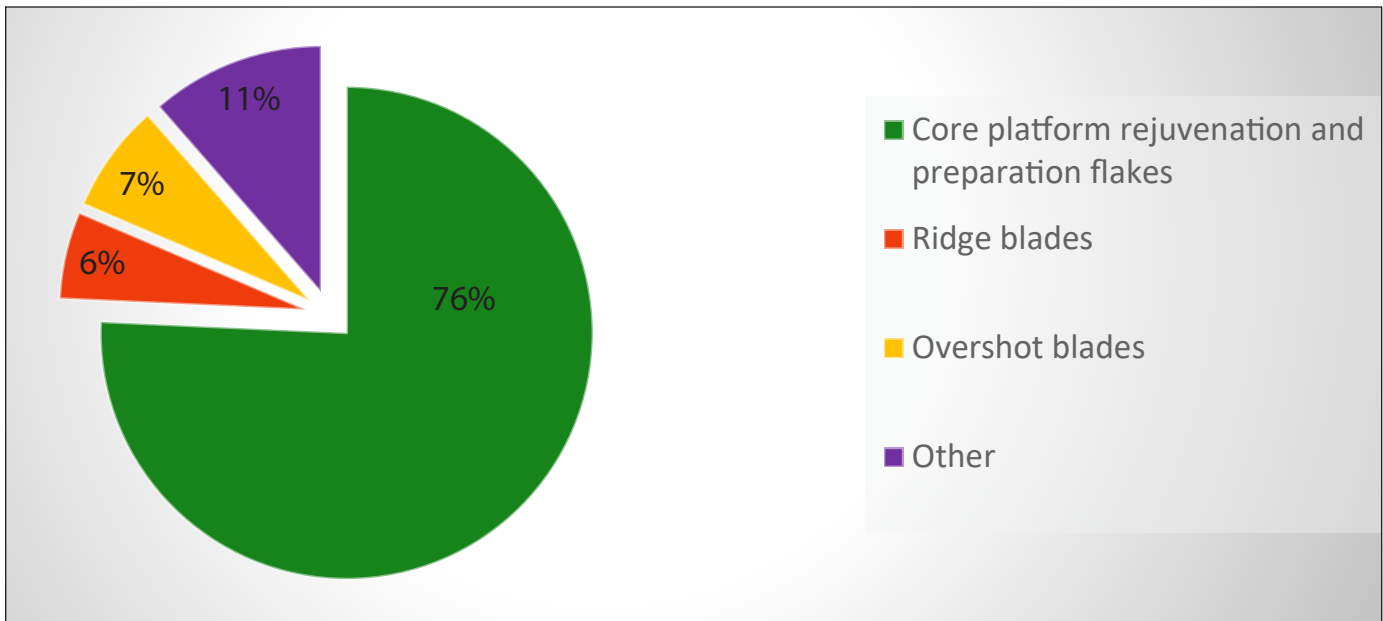


Figure 5. Different Core Trimming Elements (CTE) types (N=70).

After the desired blanks and maintenance items were removed, many of the items were shaped into tools (see below in the typology section). Retouched tools make up 48% of the assemblage – a very large amount – which testifies to an extensive and intensive use of available obsidian. The fact that a blank was shaped into a tool does not prove that it was used, but it does mean that it was selected for further processing. It is also presumed that not only shaped tools were used for different activities, but that blank blades were also used. Actual use can only be shown by microscopic use-wear analysis, however, macroscopic chipping may also indicate use (Copeland 1996), and appears on about 40% of the blank blade/lets.

Cores (N=6) – Abandoned cores presumably reflect the very last stage of the production process. Very few cores were found in trenches 3 and 4 (see Fig. 4), raising questions concerning their deposition whereabouts. The cores that were found seem to be exhausted. All but one of the cores were originally used for pressure production, though 80% of them ended up being used by percussion as well. Several cores were used on multiple faces, often in opposed directions, and many were turned into tools (wedges). All this points again to intensive exploitation of available raw material.

Several differences appear when comparing debitage class frequencies between assemblages from different obsidian sources (Fig. 6). These differences are statistically significant ($P=0.03$),

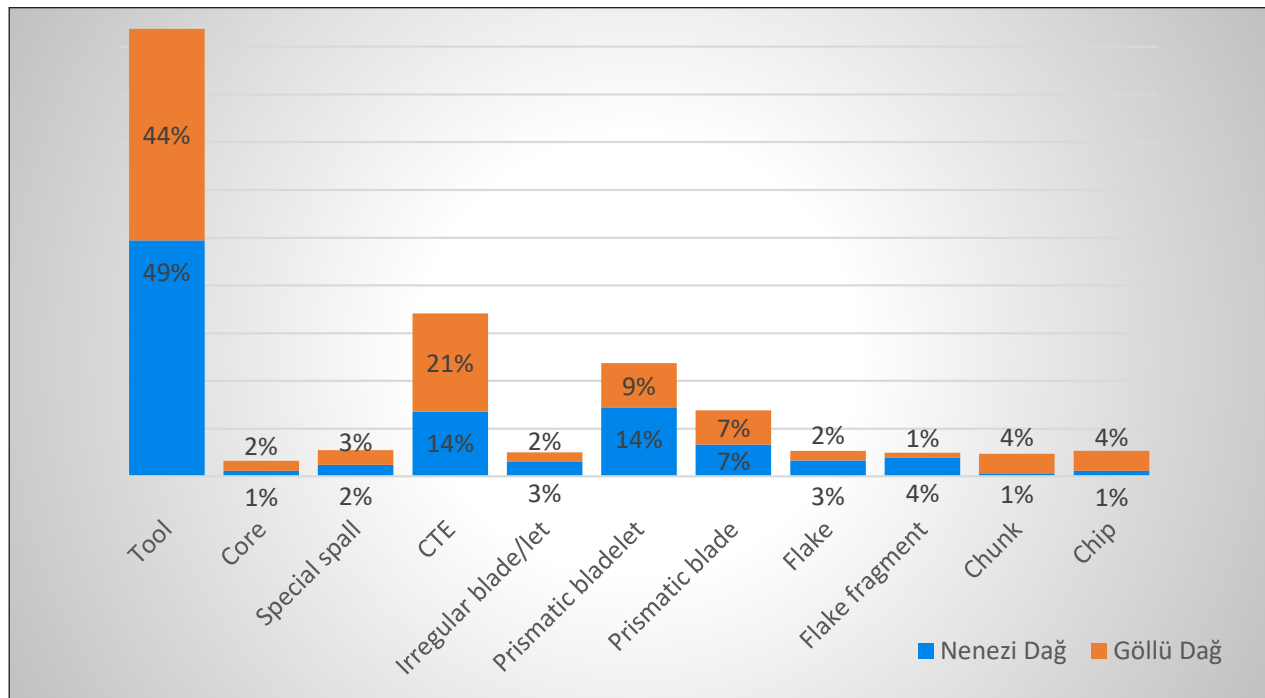


Figure 6. Differences in debitage class frequencies between Nenezi Dağ and Göllü Dağ.

pointing to a true difference in technological behavior concerning the material from the different sources.

Prismatic bladelets are more common in the assemblage from Nenezi Dağ than in that from Göllü Dağ, while the frequency of blades is equal. As the distinction between blades and bladelets in this study is based only on width (bladelets being narrower than 1.2cm), and not on any other consideration, this difference does not reflect a technological difference but rather a difference in exploitation. This may be caused by different, perhaps complementing, scenarios. It is possible that cores from Nenezi Dağ are being more intensively used, until they are smaller and produce smaller blades. There is also a possibility that pre-formed cores from Nenezi Dağ reach the site originally smaller than cores from Göllü Dağ, but as no systematic recording of maximum blade metrics was performed, it is difficult to discuss the initial sizes of the cores. Tools are also more common on obsidian from Nenezi Dağ, again reflecting a greater degree of exploitation of the material from this source. Additionally, it seems that Nenezi Dağ blades were favored for tools over Nenezi Dağ bladelets, as 76% of all blades were retouched, compared to 37% of all bladelets. This decreases the frequency of Nenezi Dağ blade-blanks, and raises the frequency of Nenezi Dağ bladelet-blanks. Comparatively, Göllü Dağ blades and bladelets were being equally chosen for tool (59% of all blades and 55% of all bladelets were retouched)

CTEs are more common in the assemblage from Göllü Dağ, as are chips and chunks. Though intensive core maintenance is necessary in any pressure production process, it is probably pre-formed more intensively by novices than by skilled knappers. This is probably also true for chips and chunks, formed by shattering during the knapping process. The higher frequency of these types of debitage in the assemblage from Göllü Dağ may indicate that the knappers performing pressure production on the Göllü Dağ material are less skilled. The association of the pressure-flaking technology to obsidian from Nenezi Dağ, and the parallel increase of the use of this technology at Çatalhöyük alongside the rising exploitation of obsidian from Nenezi Dağ, has been discussed before (Carter and Milić 2013: 436). It is possible that different people at Çatalhöyük had differential

access to obsidian from different sources, and that not everyone was equally exposed to different materials and associated technologies (Cessford and Carter 2005). Thus, this connection between source and technology, may also be reflected in the level of production skill.

Typology

The frequencies of different tool types from the selected Neolithic contexts at TPC Area is presented in Figure 7. Retouched blades are by far the most abundant tool type, followed by retouched bladelets and notched blade/lets. Though other tool types do appear, it seems that the main typological goals of the obsidian industry were quite uniform, especially compared to earlier levels at the site (Carter and Milić 2013: 418-431). This may reflect a more conservative attitude towards tool making. Additionally, as blades make up only 7% of the debitage, yet 40% of the tools, it is clear that blades are preferred and intentionally selected for shaping by retouch. This trend is accentuated on the material from Nenezi Dağ (see above in the technology section).

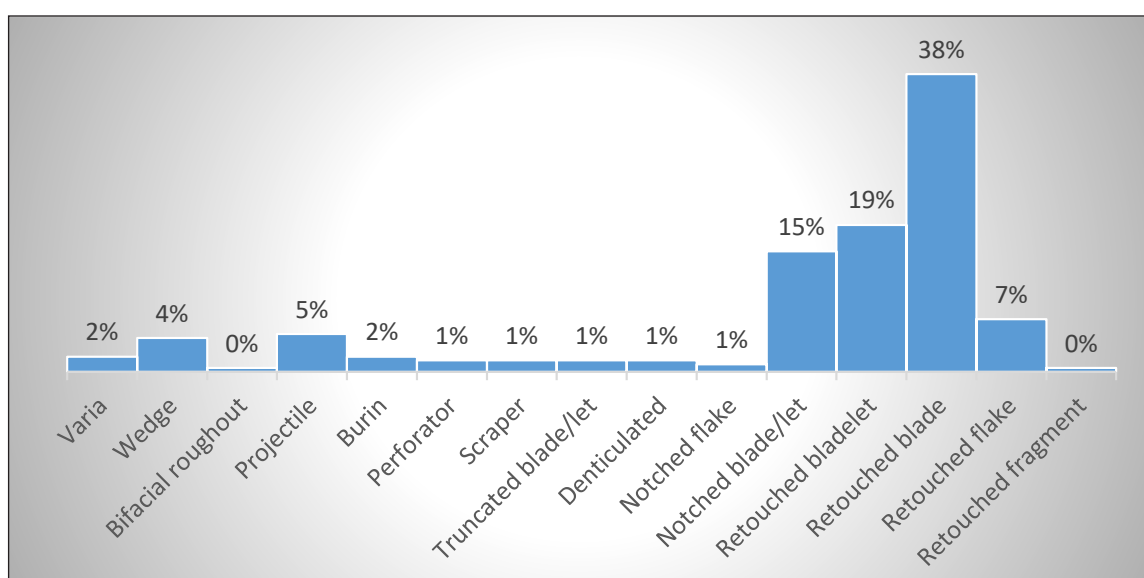


Figure 7. Tool type frequencies from selected Neolithic contexts at TPC Area (N=207).

Retouched, notched, denticulated and truncated items of all kinds – flakes, blades, bladelets etc. – are very general, non-specific tool categories, ad-hoc appropriations of blanks to be used as a tools. Other tool types show higher investment or different degrees of formality and will be described below.

Scrapers (N=3) – Scrapers may be highly invested, characterful objects (Carter and Milić 2013: 452, Fig. 21.6). However, in trenches 3 and 4, scrapers seem to be more of an expedient tool. One (20712) is made on a hammer-and-anvil split bladelet core on obsidian from Nenezi Dağ. The other two are made on flakes from Göllü Dağ, one (31850) is a nosed end-side scraper (Shea 2013: 136, Fig. 5.6p-q), while the other (31802) is a side-scraper with an old burin-blow on the opposite side.

Perforators (N=3) – Only three typologically clear perforators were found in trenches 3 and 4. However, several other instances, such as retouched blades and bladelets with converging laterals and bending breaks, could possibly have been perforators, increasing the frequency of this tool type in the assemblage.

Burins (N=4) – All formal burins were made on retouched blades from Nenezi Dağ obsidian, usually on a break. Burin blows were noticed on other tools such as a scraper (see above), possibly on an arrowhead tang (31361), and along the side of a perforator (31848).

Projectiles (N=10) – This tool type has been intensively studied at Çatalhöyük (e.g. Carter and Milić 2013: 452-475; Sadvari *et al.* 2015), and represents a central component in human-object entanglement networks (Hodder 2011, 2014), of characterful objects, with complex social biographies. All but one of the projectiles found in trenches 3 and 4 are fragments, mostly tangs, and all but one of them were made on Nenezi Dağ obsidian. Most projectiles have a tubular shape, without wings, shaped by covering retouch on all faces. Following is a description of each individual projectile point:

20714.x1: An almost-complete projectile with an unshouldered tang (Fig. 8). Its cross-section is convex-convex and profile is straight. It is covered by continuous bifacial retouch, semi-abrupt, generally good quality with a few step fractures. The stem was broken off, perhaps by a bending-break. It has an invasive oblique scar from the tip along one edge which may be the product of impact. Metric measurements: L-7.7cm W-1.4cm T-1cm.



Figure 8. 20714.x1 - obsidian projectile with unshouldered tang.

Unit (31328): A tang, broken off the projectile by a bending break, made on Göllü Dağ obsidian, fully covered by continuous retouch. It has a triangular cross-section, with two lateral ridges. It seems to come to a point at the basal end.

Unit (30830): A beautifully shaped projectile tang, with a triangular cross-section, covered by pressure retouch. The laterals converge to a basal point - the very tip is broken, with a little scar running up along the central dorsal ridge.

Unit (30831): A long, narrow, thick projectile tang. A percussion blade scar removed one entire face, possibly during breakage.

Unit (31361): A projectile tang, with somewhat of a bending break, unifacially covered by retouch on the dorsal face (ventral face left untouched). It comes to a point at the basal end. An oblique burin scar runs shortly along one lateral – possibly produced by impact.

Unit (31363): A projectile tip fragment, with a sharp, pointy tip, plano-convex cross-section, covered by bifacial pressure retouch.

Unit (31802): A Byblos Point (Gopher 1989: Fig. 1.A5). It has flat, bilateral retouch covering the ventral face; abrupt, bilateral retouch creating the tang and indent below the rounded wings. Both the

tang and tip are missing - deep flat bending break of tip, abrupt bending break of tang – possibly by impact.

Unit (31842): A projectile in preparation. One lateral is fully shaped by direct abrupt retouch to form a tang and barb, while the other lateral has only flimsy irregular direct retouch. The barbed projectile type is rare at Çatalhöyük, and restricted to the upper layers (Carter 2012: 198).

Unit (31846): About half of a leaf-shaped projectile, shaped by covering bifacial pressure retouch. The projectile ended up being used as a wedge. Bashing marks are visible on the base (thin and wide, like a screwdriver, see below) and also on the break. One of the strikes, or the break itself, left a bladelet scar on the center of one of the faces.

Unit (31850): One retouched lateral of a thick, narrow and long, convex-convex type of projectile. Its other side was broken by a strong strike, perhaps impact, like a very wavy burin-blow.

Bifacial roughout (N=1) – Uncharacteristically to the upper layers, what seems to be a Göllü Dağ bifacial roughout (Carter and Milić 2013: 420-422, Fig. 21.3), was found in a midden (31832). However, it is not leaf shaped, more trapezoidal, perhaps like an axe. It may have ultimately been used as a wedge.

Wedges (N=9) – This typological category corresponds with what is often referred to as *pièce esquillée* – an item with bifacial “bashing” scars on two opposed ends. Though still debated as to its nature as a tool, a core, or a splinter produced by hammer-and-anvil percussion (e.g. Shott 1999; Furestier 2009, 2010; Jeske and Sterner-Miller 2015), here we consider them as tools, as they raise the association of wedges used for splitting things. Different artefacts were ultimately used as wedges, including flakes, tools and cores. They seem to share a recurrent shape – one end is transversely linear, wide yet sharp; the other end is more pointed, or concentrated to a blunt point. Metaphorically speaking they seem to resemble a double ended screwdriver – one end slot, the other Phillips.

Varia (N=4) – The varia category includes peculiar items which do not fit into any of the formal categories. All four items included in the varia were made on Nenezi Dağ obsidian. One is a heavily beaten exhausted core, with retouch or wedge crushing in many different spots (31363). The other three are abraded-edge blades. Abraded blades are known from elsewhere at Çatalhöyük, such as the TP Area (Carter 2012: 199), or related to ‘Çayönü tools’ as stone carving implements (Carter and Milić 2013: 440, Fig. 21.15). The roundness of the abrasion on the edges of the abraded blades found in the TPC Area, points to scraping activity more than cutting, sawing, engraving or incising. It could be caused by scraping an abrasive medium-hard material – dry hide or dry clay (Alice Vinet, pers. comm.).

Conclusions

The assemblage from Trenches 3 and 4 in the TPC Area is dominated by obsidian from Nenezi Dağ, followed by a minor component of obsidian from Göllü Dağ, and single items from Bingöl. Single items made of flint were also found. This is a typical composition of raw materials for the later Neolithic occupations at the site (Fig. 9).

The obsidian industry is dominated by pressure production (Fig. 9). The main technological component are pressure produced blades and bladelets. Most other items may also be related to the pressure debitage industry, deriving from different stages of core-maintenance. Cores were initially shaped and prepared for reduction elsewhere, brought “readymade” to the site, and were reduced by pressure on site. The reduction started with larger blades and ended with bladelets. The reduc-

tion process reduced the circumference of the core, and the platform maintenance reduced the length – the cores got continually smaller and bladelets replace blades. The cores were then possibly deposited elsewhere, as hardly any cores were found, or used, as we have several examples, such as wedges (*pièce esquillée*) or shaped tools.

Concerning skill and expertise, there is no doubt that the people of Çatalhöyük knew how to perform different reduction techniques, in different levels of skill. Though the industry is dominated by pressure, hard and soft stone percussion was also used, as well as indirect percussion and pressure by lever. As is known from other sites with similar technological compositions (Schechter 2013, 2016), both pressure and percussion – blades released by pressure and maintenance flakes released by percussion – were performed as part of the same production method, or scheme, which seems to be highly standardized. Many of the blades look like they were made in a factory, with perfectly straight parallel sides and arrises. They represent a very high level of expertise and great craftsmanship, and the products of this great craftsmanship, were common.

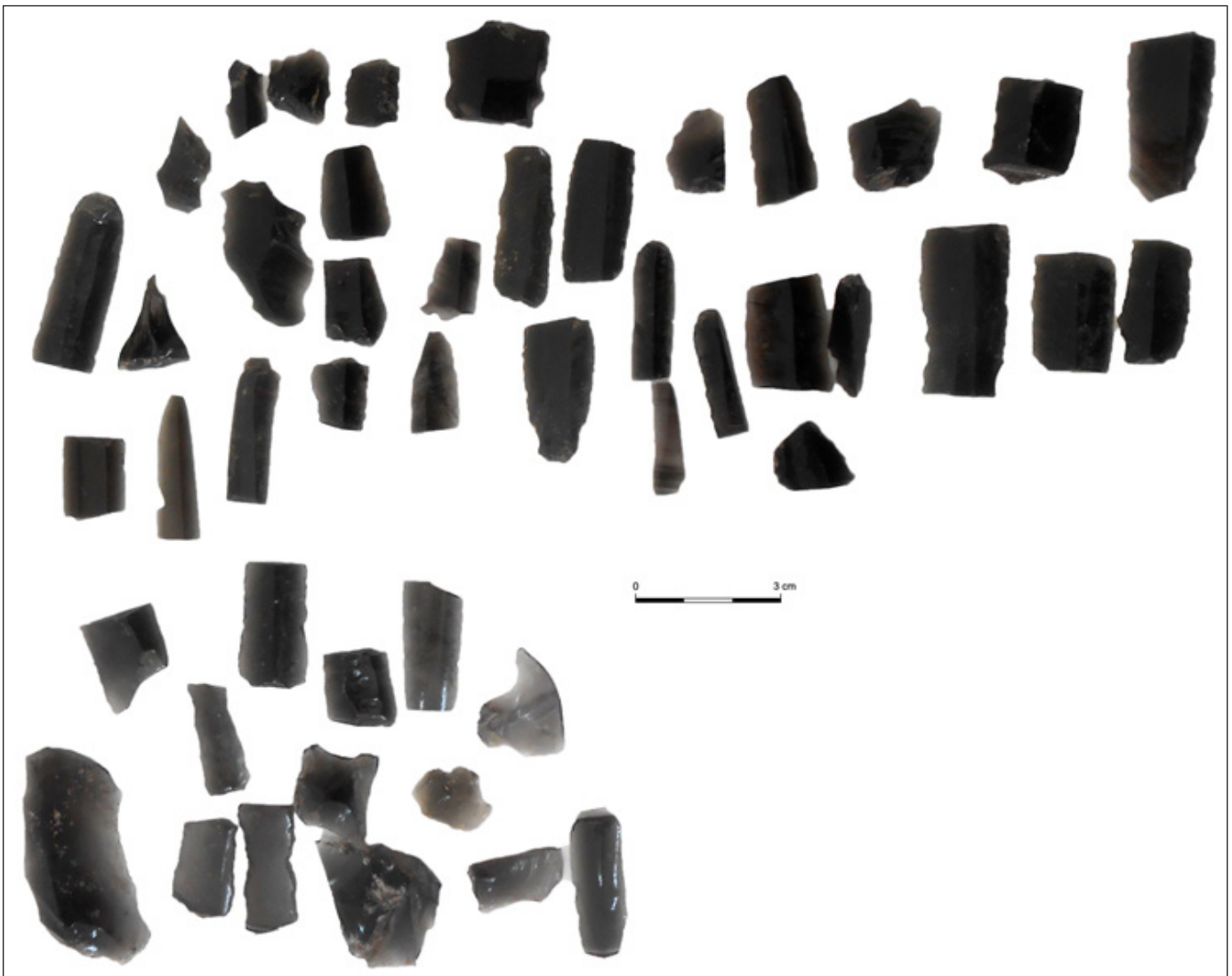


Figure 9. A typical assortment of obsidian items from the TPC Area – items originating at Nenezi Dağ on the top; items from Göllü Dağ on the bottom; notice the common prismatic bladelets produced by pressure; other items are core trimming elements; and many items are retouched, considered as tools.

Tools appear in extremely high frequencies, dominated by retouched blade/lets but also flakes were retouched. Retouch intensity ranges from use-related edge-damage (on blade/lets in the debitage), through light retouching, regular retouch that was intended to shape the tool, to intensive recurrent retouch actually deforming the tool. Together with the state of the exhausted cores, it is clear that there was intensive and extensive exploitation of raw material, not much was wasted.

The obsidian assemblage from trenches 3 and 4 in the TPC Area is greatly comparable to that of the TP Area, as presented by Carter (2012: 197-201), which in itself is continuous to the later levels of the South Area sequence (Level South S) and the North Area (Level North I). Parallels can be found in the source composition, the concentration on pressure technology, performed on site from cores which were shaped elsewhere. Typological parallels may also be found with projectiles seeming to be the only highly invested tools, shaped by intensive retouching. Blades with abraded or ground faces and margins also appear. Additionally, contexts do not seem to include hoarding, though clusters and post-abandonment deposits do appear. All these observations seem to be typical to the later Neolithic occupation of the site.

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Chapter 14

Ground Stone Technologies

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Work carried out in the ground stone lab focused mainly on the study of material from priority units excavated during the 2016 field season. Additional time was devoted to the technological analysis of the two stone figurines unearthed in B.150 (TPC Area) (see 2016 figurines archive report), and to the study of stone axes and marble bracelets. In total, 593 objects (including heavy residue samples) were recorded, 437 of which come from 31 priority units.

Level	Frequency	Percent
Unassigned	77	17.6%
North G?	209	47.8%
North F?	9	2.1%
North E	17	3.9%
North F	23	5.3%
North unassigned	83	19.0%
South K	17	3.9%
South O	1	0.2%
South R	1	0.2%
Total	437	100%

Table 1. The temporal distribution of recorded ground stone artefacts from the 2016 priority units.

abrasers, palettes and polishers), stone axes and adzes, ‘maceheads’, stone beads and marble bracelets, flakes and other waste by-products from the production of ground stone artefacts.

The main research themes explored during the study of these contexts included the use of heated stone technology for cooking practices during the earlier levels of occupation, and the use of external areas for stone-working activities. In relation to the first theme, the material from B.17 seems to be most informative. Excavations revealed small concentrations of material (clusters) that included natural limestone cobbles of different sizes and fragments of andesitic grinding tools often found together with clay balls. While Atalay and Hastorf (2006) discussed the use of clay balls as heating and cooking devices, the use of stones in cooking practices has not received much attention at Neolithic Çatalhöyük. Cooking practices associated with the use of heated stone technology—well documented in ethnographic contexts especially in areas where container technology included wooden vessels and basketry (cf. Adams 2002; Thoms 2008)—are quite diverse and include stone boiling (convection cooking), roasting and baking. The type of contact (direct or indirect), the cooking environment and the associated temperatures can result in differences in the type of surface alteration encountered (Adams 2002). The stone component of the clusters from B.17 presents variability in the degree of thermal alteration visible on the object surface with some objects

having intense surface discoloration and fractures, while others showing limited cracks or even no heat-related surface alterations. Moreover, the use of rocks of different lithologies (e.g. fine-grained volcanic rocks, limestone) with different textural characteristics and therefore mechanical properties may also indicate variation in heat-retention capacity. The combined use of rocks with different thermal properties along with the use of clay balls potentially indicate an attempt to affect and control temperatures reached during cooking practices. In B.17 one of these clusters was stored inside a pit; the stone component of the cluster contained both complete and fragmented pieces with varying degrees of burning suggesting that these pieces were used multiple times in thermal activities—even as fragments—before they were discarded.

At Çatalhöyük, clusters of fire-cracked natural cobbles of similar size (c.5-10cm), often found near hearths and/or ovens together with clay balls, tend to appear more frequently in the earlier phases of habitation (cf. Atalay and Hastorf 2006). This was also confirmed during recent excavations in B.17 in the South Area (Level South K) and in B.132 in the North Area (Level North E). This may suggest that during the earlier levels of habitation the use of heated stone technology was a routinized cooking method regularly performed along with other daily household practices.

The second research theme focused on the use of external areas for stone-working activities (see also Tsoraki 2015). During the 2016 excavation field season J. Issavi (Stanford University) initiated a project focusing on the detailed excavation of an external area east of B.131 and north of B.114 in the North Area (mainly Sp.85 and Sp.601; the latter refers to the area below Sp.85 that predates the construction of B.129). While the study of material from Sp.85 and Sp.610 is still work in progress, initial observations seem to support current understandings about observed variation in assemblage composition and degree of preservation between external and internal areas with more evidence for stone-working debris associated with the former, while formal tool categories such as grinding tools occur more frequently inside the buildings. Furthermore, compositional variation is also encountered between different external areas, pointing towards the differential use of space at different temporal phases in the lifecycle of the settlement.

Among the objects unearthed during the 2016 excavation season the following deserve special mention. Three maceheads, one complete and two fragmented, were found in 2016. To date, less than 30 examples have been recovered, including 15 examples from Mellaart's excavations stored at the Konya Museum (Wright 2013). It was previously suggested that these elaborately perforated objects make their appearance later in the temporal sequence at Neolithic Çatalhöyük occurring from Level North G onwards (Wright 2013). The examples found in 2015 and 2016, however, come from contexts attributed to earlier levels of the habitation sequence (Levels South K and North F) suggesting therefore an earlier introduction of this elaborate form of ground stone technology than previously thought. Among the examples unearthed in 2016 a complete macehead with an intricately carved design, a product of fine craftsmanship, stands out (Figs. 1 and 2). 22194.x1 is a complete spherical 'macehead' that measures 61 x 66 x 64mm and weighs 360g. It was found in the North Area and more specifically in Sp.154 of B.5 which is dated to Level North F. It was found together with a group of other objects (four obsidian projectile points and a possible shell container with pigment traces) in association with a skull deposition Sk (22196). The skull was placed inside an organic container together with a series of flint objects and shell, while the marble 'macehead', obsidian projectile points and the painted shell were found outside the organic container. The 'macehead', made of high-quality white marble, survives in a very good condition, with no evidence for thermal alteration. Part of the surface, however, exhibits light pitting due to post-manufacture weathering which has resulted in a rough-looking surface. A black residue (most likely tar,



Figure 1. Marble 'macehead' with incised decoration (photo Jason Quinlan).



Figure 2. Marble 'macehead' with incised decoration (photo Jason Quinlan).

sampled by the conservation team in June 2016) spreads around the perforation, near the area where the weathered surface is, while spots of residue are visible around the edge and the interior of the perforation. The outer surface of the object was smoothed and polished prior to the incision of the very elaborate pattern; the interior of the incised lines are not polished to the same degree. The 'macehead' has a biconally drilled perforation exhibiting concentric striations (Fig. 2); the point where the two opposed perforations met is clearly visible as they are slightly off-center. Lack of wear traces in the interior of the perforation suggest that prior to its deposition in the burial the 'macehead' had not been affixed to a shaft (handle/haft). This together with the overall surface condition suggest that the 'macehead' was deposited in the burial not long after it was made. At one end of the perforation a pronounced lip is visible. Overall, the incised decorative pattern is very well executed with the incised lines showing consistency in their spacing and width (c.2.02-2.50mm). The execution of the intricately motif and the lack of manufacturing errors during the carving action suggests that this was the work of a highly-skilled craftsman. It is very likely that during the execution of such an elaborate and unique design on the actual stone a mock-up, made of clay or an organic material such as wood, was used. While incised decorative motifs have been encountered on the surface of other materials (e.g. decorated grooved abraders and stone vessels), this is the only example of a decorated 'macehead' found on site to date. I argued elsewhere (Tsoraki 2008, 2015) that the production of these perforated objects shows concern for the creation of objects of a visually distinctive appearance. This was often achieved through the use of rocks with a striking color and textural patterning. The incised 'macehead' was made from white marble of high quality and this in combination with the intricately carved decorative pattern that runs across its whole surface creates a particularly striking effect. All known examples of 'maceheads' deriving from both Mellaart's and Hodder's excavations are finished objects and no preforms have been identified at Neolithic Çatalhöyük to date. This in tandem with the use of a rare material of non-local origin and the uniqueness of the incised pattern (with no other parallels on site) possibly suggests that this was an exotic object that was introduced to the site as a finished object.

21827.K1 (South Area, B.17, features and floor Phase E, Sp.170, Level South K) is a limestone 'mace-head' that was found broken in half. This is the earliest example found at Çatalhöyük to date. The surviving dimensions are 48 x 53 x 30mm and the weight is 92g. It has a central biconical perforation the interior of which exhibits very pronounced concentric striations that form wide bands. This suggests the use of an abrasive material during the drilling stage. At the meeting point of the two opposed perforations a pronounced ridge is visible. The outer surface of the object is highly polished with very fine striations. Following its breakage, the biography of the 'macehead' was prolonged; it was reused as a hammerstone along the fractured edge and the body. Observed wear traces include flake scars and some bruising of the surface.

22676.K2 (North Area, B.131, Sp.500, F.7963, Burial infill, Level North F) is a small fragment from a 'macehead' that retains part of the perforation and the polished body surface. The interior of perforation seem polished possibly from hafting. The piece shows evidence for thermal alteration. It is made of a medium grained veined metamorphic rock. The choice of material is interesting as different varieties of limestone and marble are the preferred choice of material. The veined texture of the material, however, fits with the overall pattern of raw material selection (i.e. choice of rocks with distinctive textural features).



20736.x2 (TPC Area, B.150, Sp.594, F.3855, construction/makeup layer of platform) piece of galena found in close association with figurine 20736.x3 (Fig. 3). The dimensions are 21 x 12 x 2mm. The object has perfect cleavage, metallic shiny appearance and is opaque. It has straight abraded edges, while one ridge between margin and body has intense chipping with unifacial irregular removals. Similar wear traces are encountered during contact against hard materials. The abraded edges of the piece have lost their shiny reflective appearance. Interestingly, similar traces of dull use-wear polish are observed on obsidian tools used against abrasive materials. Based on the wear traces, it is possible that this object was associated with the manufacturing process of the figurine 20736.x3. If indeed this piece has been used as a tool, it would be interesting considering that similar pieces of galena found at Neolithic Çatalhöyük tend to be used as ornaments/pendants.

Figure 3. Piece of galena 20736.x2 found in association with figurine 20736.x3 (photo Jason Quinlan).

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Chapter 15

Ceramics

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Introduction

During the 2016 season, priority was given to the investigation of ceramics from B.160 and B.118 in the South Area and B.5, B.132 and B.131 as well as Sp.85 in the North Area, and B.150 in the TPC Area. The units given priority from among the areas and buildings listed above were: (31553), (32106), (32113), (32114), (22641), (31578), (32405), (22300), (20714), (20712), (32495) and (22334).

South Area

Apart from the large quantity of ceramics coming from the upper levels of the TPC Area excavation, as in every season, a very small number of ceramics was recovered from the early and middle layers of the South and North Areas. However, the early period ceramics recovered from the South Area this year, particularly diagnostic examples from B.160 and B.118, have made a great contribution to both the dating of these buildings and to improving our understanding of the manufacturing techniques of early period ceramics.

Building 160, Space 551

During the excavation of the infill (22300) of the central room (Sp.551) of B.160, four diagnostic pot sherds were recovered (Figs. 1 and 2). All of them are base fragments. These very thick bases show the typical features of early pottery traditions such as plant tempering, local silty and backswamp clay, coarse texture, low and irregular firing and poor quality in terms of surface treatments. According to earlier pottery studies, these sherds can be safely dated to Levels South K-J or more likely to South J. There are five body sherds which share the same features as the diagnostic examples. They may belong to the same vessels.

One of the base sherds (S4) has basket or mat impressions on the outside of the base. This is the only example of mat impressions on a baked clay vessel for the Neolithic period at Çatalhöyük. It seems that the vessel was made/shaped and/or dried on a mat.



Figure 1. Base sherds (22300.SI-4) from B.160, Sp.551 infill.



Figure 2. Base sherds (22300.SI-4) (alternate view).

North Area

Building 132, Space 531

The ceramic examples recovered from the infill of a post-retrieval pit (31553) in Sp.531 of B.132, which is the earliest building yet to be excavated in the North Area and is probably a communal building, are extremely important both for the dating of the building and also for our understanding of the transition between the ceramic traditions of the early and middle levels.

In unit (31553), some base sherds were found in the western part of the fill. When the pieces were joined, bases belonging to three different vessels were identified (Figs. 3 and 4). All of them are 'Light Silty Ware', i.e. thin, plant-tempered, low-fired and soft in texture. Although the clay source (local clay), texture and firing conditions are of the early tradition, all of the sherds were shaped in the new forming technology, which first appears in Level South L/North F. They have thin sections and seem to have been made by the paddle and anvil technique. In accordance with the new tradition beginning in the middle levels, they have dark gray and brown mottled and burnished surfaces. Thus, although these sherds were produced with early level raw material, they were made of by new form technology and surface treatment and they can be defined as 'transitional tradition' sherds, dated around Level South K/North E.



Figure 3. Three base fragments (31553.SI-3), from B.132, Sp.531, infill of a post-retrieval pit. **Figure 4.** Three base fragments (31553.SI-3), from B.132, Sp.531, infill of a post-retrieval pit (alternate view).

In addition, from the same infill (31553), along with the pottery sherds were recovered various artefacts types such as obsidian, flint tools, shell, bone, clay balls and beads. However, it is not clearly understood whether there is a relationship between these rich varieties of artefacts or whether each was placed knowingly within the pit. For example large fragments of animal bone were not identified as a cluster because it was not certain whether they were concentrated in one location or at a single elevation. The presence and position of the animal bones in the same fill with clay balls makes one think that they ended up in this pit fill by chance - placed there by accident during the

filling of the pit. According to the interpretations of the excavators, all the artifacts within the fill of the pit were left in the south dirty-floor and kitchen activity area during the abandonment of the building to be collected later and during the back-filling of the post-retrieval pit might all, along with the animal bones and clay balls used as a part of the daily activities, have been put in the pit.

However, the flint tools at the very bottom of the pit fill suggest deliberate deposition, because in post-retrieval activities this type of deposition, especially for chipped stone tools, is usually found as a “special deposit” during the abandonment of the building.

Likewise the recovery of ceramic sherds only from the west of the fill in one area, rather than scattered randomly, suggests that these sherds might have been deliberately deposited within the pit. However, it is not certain whether or not there is a relationship with the other artefacts or not and whether they were all placed with the same purpose, as part of a house closing practice. On the other hand, why all the sherds are only base pieces, looks like it will remain a question mark, at least for the moment.

Space 85

Unit (32106) in Space 85 consists of a mixed dump, which is rich in artifacts. Despite this richness of find types the ceramic evidence is neither rich nor diagnostic and is really made up of very small body parts. However, the tiny sherds in question do give some ideas from the point of view of fabrics and technologically they appear to be from the mid-levels.

TPC Area

One of the major discoveries during the 2016 season was the unearthing of a complete vessel found *in situ* within a pit (20754) in Sp.612 of B.150 (see TPC Area excavation chapter for further details). The vessel (20755.x1), missing one handle and with deep cracks on the body, contained the remains of burnt wheat, and is of enormous importance for both pottery and botanical studies (Figs. 5 and 6).

According to Arek Marciniak: “This vessel’s stratigraphic position indicates a deliberate deposition in relation to one of the events related to the reconstruction of the space of large Building 150. The building is located in Trench 4 in TPC Area and belongs to the largest houses found on the top of the East Mound in TP and TPC Areas. It is tentatively dated to Level TP M, which may correspond to Level III/IV in the Mellaart chronological scheme. The original floor of the building has not yet been reached. The ongoing works in the area made it possible to establish that B.150 was long in use and underwent at least three major reconstructions. The latest phase (Sp.594) has been completely studied to date. It is characterized by a sequence of in-built structures including a solid floor (F.8276) in its central part, four platforms against eastern wall of the building and three platforms in southern and central part of the building. The pot was found underneath the northern edge of one of the latter platforms (F.3873). The platform was placed in the southern part of the building against some kind of earlier, but largely destroyed, platform, from the preceding occupational phase. The platform was long in use, and served as a place of numerous fire installations built one on top of the other. These comprise one fire spot and three ovens. The pot was placed right before the construction of the platform and preparation of the earlier oven. However, it was most likely placed directly north of a large oven belonging to earlier phase of B.150 use (Sp.612). The pot was placed in a circular and regular pit (F.3850), most likely deliberately prepared to hold the

vessel. It was dug into the floor belonging to Sp.612. However, the character of the oven and corresponding floor has not been completely recognized in this year's excavation season".

The complete pot had two lugs but one of them is missing. It is a 'Dark Gritty Ware' type of good quality. The pot is well-burnished and has traced burnishing. The vessel has a capacity of c.3.5 liters. Some part of the outside surface close to the base is gray in color and mottled dark gray, brown and dark brown. But, the vessel as a whole looks dark in color (dark gray). The core of the vessel cannot be seen clearly, only when we look at the broken lug section is any core seen and the paste color is gray.



Figure 5. Whole vessel from TPC Area, Sp.612, B.150.



Figure 6. Whole vessel from TPC Area, Sp.612, B.150.

The layer of infill within the pot was recorded as (20761) and excavated by the conservation lab specialist. Two layers have been recognized within the fill of the pot and taken as two different flotation samples (20761.s5 and s6). Standard archive sample (0.5 liters) (20761.s4), C14 dating (20761.s3) and botanical charcoal (20761.s7) samples were also taken from the fill of the pot. Sample 20755.s3 was taken from the soil underneath the pot. Samples for starch analysis were also taken from the surface of the pot. The pot was left unwashed.

As the conservation specialist described, the top half of the infill was similar to the surrounding building infill. Reddish, loose soil with plaster inclusions was abundant. There was a broken bone point and some small bones in it. It also contained some cereal grains but not as much in abundance as in the bottom half.

The lower half of the infill was markedly different, as it was a darker and included cereal grains and small bones. We do not yet have any results for the bone pieces regarding whether they are human or animal. A large groundstone was found in this level (20761.x1). The ground stone specialist says that this tool was used for wall burnishing and there is nothing clear about the function within this context. This tool seems to have no relation with cooking activity. If so why was it in this pot? In addition, although the wheat grains and the vessel itself were burnt, this tool was not. When it was found within the vessel it looked as if it was burnt, but after it was washed,

it became clear that it was not. A rare clay object resembling a stopper was also recovered from the pot fill. Compact residue adhered to the bottom of the vessel, next to the ceramic surface.

The outside of the bottom of the vessel is light in color and does not seem burnt. The same is true for the soil underneath the pot, which is light in color. On the other hand, the upper part of the base, to the belly of the pot, the wall of the pot from inside and outside was heavily burnt. Thick burnt remains surrounded the pot.

If any charcoal is found surrounding the pot after analyses, we may think that it was burnt within the pit, in the same place, however if we don't see any firing activity under the pot, the vessel might have been burnt and then put within the pit. Did it represent a daily cooking activity resulting in burning or was it a kind of burning activity for a ritual? If so what do the other finds mean? Were they put in the vessel deliberately after burning for a ritualistic purpose?



Figure 7. Bowl with incised decoration (20714.S1) from the TPC Area, Sp.594.

Again in the TPC Area, in Sp.594, (20714) another important pottery artefact came to light (20714.S1). This unit is probably a post-abandonment cluster, located on the floor (31858) in the northwest corner of Sp.594, right below an infill (20709) of Sp.595. Space 595 has been defined as an infill and later reuse of a central room of Sp.594, delimited from the south by the north-south wall of Sp.578. The cluster consists of two obsidian points, worked stone, and many fragments of pottery, most likely originating from one vessel, which were placed beneath a cattle scapula.

Half of a bowl comes from this probable post-abandonment cluster. This vessel has parallel incised decoration on the rim. It is not a coarse pot, and does not seem for daily purposes. Even though it is not exactly like a face pot, it is still a special and rare vessel. It can be dated

to Levels TP M-N (Level IV-II). It is in good condition and wasn't burnt or damaged in any way. It has some fresh breaks, so the rest of the vessel may be within another unit. It looks as though the vessel was placed within the cluster deliberately.

Other work

Studied units not on the Priority Unit List were: (22336), (22324), (21987), (22353), (22354), (21984), (22356), (21974), (30382), (19825), (19850), (19838), (19830), (19833), (21974), (22356), (20313), (19693), (20319), (20375), (20342), (20307), (20309), (20327), (20404), (32105), (32113), (32105), (31553), (22344) and (32340). Some notable features from these units are:

Building 89, (21984): The body sherds from this unit are of a transitional character. The pieces in question have mineral inclusions and from their paste structure and firing quality it can be understood that they were from a breakable and experimental phase. The find spot of these body pieces, B.89 is ascribed to Level South N in the records. However, given the experimental and transitional

character outlined above this building can be dated to earlier than Level South N, which is to say at least to Level South M.

Space 559, (2235): From this unit came a very thick base piece. This piece may be related to B.160, Sp.551 and Sp.552. A surprising amount of pottery, completely unexpected in early levels, came from these buildings. The piece is a very well finished form and there are signs of a pale red slip. There are no indications of use wear.

Building 118, Sp.510, (22354): A base fragment was found that is of good quality in terms of surface treatment, texture and firing.

Among the works carried out this year was the detailed description and dating of some materials coming from the North and South Areas in previous seasons. Additionally, because the excavation season finished earlier than was planned, some pieces from the 2012 to 2015 seasons remain unstudied.

Among the results awaited with curiosity next year are the phytolith analyses taken from some of the ceramics, particularly those that will show the presence/absence and quantity of starch.

In addition to these studies conducted in 2016, with the help of Sermin Dinç an undergraduate student at Istanbul University in the Department of Prehistory, separation, grouping and basic registration has been carried out in preparation for the detailed analyses that will be completed in the future. In these studies, all the material recovered from the TPC Area excavation was brought to the laboratory for detailed analysis and to ease the analyses all materials were ordered according to unit number. Consequently the materials in question were separated into Neolithic, Chalcolithic and Post-Chalcolithic categories according to the specific features of the period. This was then recorded and entered in the database at what we call the first level, which is to say by counting and weighing. The materials in question total 17,680 pieces and weigh a total of 401 kg. The sherds dated to the Neolithic period that are diagnostic were separated. These sherds' features including manufacturing technology, methods of shaping, surface working, typology and the associated use functions were researched and detailed analyses were started, however, because the project finished early the analyses were aborted, to be continued in 2017.

As part of the preparation for the publication of the TPC Area this year photographic digital records of the diagnostic Neolithic pottery pieces recovered from the South Area between 2012 and 2014 were produced. Lastly, all materials from the GDN Area were left awaiting study in 2017.

Chapter 16

Geometric Clay Objects

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Bülent Ecevit Üniversitesi

Introduction

Small, geometric-shaped “clay objects”

Artifacts studied under the umbrella of “geometric clay objects” include two of Çatalhöyük’s small find artifact classifications: small, geometric-shaped clay objects, henceforth “clay objects” (Bennison-Chapman 2013, 2015) and the larger, more homogenous large clay balls (previously interpreted as cooking balls: Atalay 1999, 2000, 2001, 2005, 2009, 2012, 2013; Atalay and Hastorf 2006), henceforth “clay balls”. Çatalhöyük’s small, geometric-shaped clay objects (often referred to as “tokens”) have been extensively studied as part of ongoing research into their role, distribution and function within Neolithic West Asia (Fig. 1). Clay objects as an artifact category, defined and described extensively elsewhere (Bennison-Chapman 2013, 2014), consists of intentionally crafted clay (and comparable stone examples) artifacts measuring an average of 2cm maximum dimension, overwhelmingly weighing less than 6g; present in a range of three-dimensional shapes such as spheres, discs, cones and cylinders. Çatalhöyük’s clay artifacts and clay materials have been thoroughly surveyed, with almost all known examples of clay objects from the site extensively studied from 2009 onwards. At the end of 2016 season, a total of 1,360 small, geometric clay objects have been individually studied and recorded from Çatalhöyük East (Bennison-Chapman 2013, 2014).



Figure 1. Example of small, geometric “Clay Objects” recovered from Çatalhöyük East (studied in 2015).

Large “clay balls”

Çatalhöyük’s clay balls were the subject of a research project by Ass. Prof. Sonya Atalay (University of Massachusetts Amherst), completed in 2009. A new phase of clay ball study commenced last year, with objects excavated from 2015 onwards subject to renewed detailed recording and study. In 2015, a total of 381 large clay balls (or fragments thereof) were studied.

During the 2016 season, clay balls, as an artifact category were the focus of research. Clay balls are far more homogenous than the smaller clay objects. Though largely present as fragments, they are immediately recognizable due to their large size, which tends to range from 7.00cm-10.00cm diameter. Çatalhöyük’s clay balls are crafted from a fine, highly compacted clay, with few visible inclusions. They have an extremely smooth outer surface, which often exhibits shallow fingertip depressions from manufacture, and can appear burnished in appearance. In weight, they are dense, with a small fragment weighting significantly more than a small geometric clay object or clay figurine of a comparable size. As their name suggests, the objects are spheres, and their shape is extremely regular and uniform. This season, some exceptions to the above characteristics were recovered, yet these objects were classified as and therefore recorded along with the large clay balls for lack of an alternative classification. The aims of the renewed study of the large clay balls was to reconsider the cooking function of these objects, and also study their overall distribution within and across the site, looking at broad temporal patterning, as well as their immediate context, fragmentation patterning, post fragmentation burning and wear patterning, to consider alternative interpretative functions, including secondary functions of clay ball fragments.

Recording stages and phases

Both the small clay objects and large clay balls are initially identified and registered on the Finds Register when recovered, constituting stage 1 of the recording process. Up until the 2016 season, both sets of artifacts were then recorded in detail, with many varied aspects of form, appearance, manufacture and wear studied. With the number of objects, large clay balls in particular increasing dramatically during the long 2016 season, it was decided to introduce a two tiered recording system, similar to that of the pottery and other teams. For both object categories, basic recording was carried out at a “level 1”: recording the total number of clay ball fragments per unit, with the total unit weigh (objects were not individually assigned numbers). Select units were then selected to be studied fully, as per the 2015 strategy, receiving individual numerical identifiers. The large clay balls were prioritized in the 2016, due to the sheer quantities being recovered, and the fact that this second phase of their study only began in 2015. This combined with the early closure of the site meant that a very small number of clay objects were recorded during the 2016 season, and none of the objects were photographed for publication.

The geometric clay object assemblage

Small geometric clay objects: 2016 season summary

100% of incoming clay materials (aside from that of the last three days of excavation pre closure) were assessed and sorted according to artifact category, with all artifacts falling into the classification of clay objects registered on the Finds Register, ready to be studied. Objects from a total of 11 units, totaling 41 pieces were further recorded at level 1. An additional 100 clay objects were fully, individually studied at level 2, a total of 133 artifacts within the classification of clay objects (Table 1).

GEOMETRIC CLAY ARTEFACT TYPE	DETAILED STUDY (I)	BASIC RECORD (II)	TOTAL RECORD COUNT
(Small) Clay Object	100	11	111
(Large) Clay Ball	628	127	755
Both combined	728	138	866

Table 1. Detail of the geometric clay objects registered, recorded (level 1) and studied individually in full (level 2) during the 2016 excavation season.

Clay balls: 2016 season summary

Large clay balls were overwhelmingly the most numerous find during the 2016 excavation season. During the final three days of excavation alone, two full crates of large clay balls (mostly fragments) were excavated from two buildings during the closure of the South Area. The aim of the season was to record all clay balls, from all areas fully (at level 2), yet it soon became clear this was an impossible task. The research strategy soon changed to incorporate a two level recording system (as described above), with all clay balls from Priority Units to be recorded at level 2. However, this strategy did little to reduce the work-flow, therefore, the decision was made to only record those objects from Priority Units.

A total of 628 large clay balls (or fragments thereof) were individually studied in detail during the 2016 season. A further 127 objects were recorded at a basic level (level 1) (Table 1). This season's study primarily covers clay balls excavated during 2016, but also some excavated during the 2015 season. In addition, 60 objects were registered and assigned as individual finds and database number, yet the full (level 2) analysis was unable to be undertaken due to early site closure. As was photography for all clay balls and clay objects during the 2016 season.

Clay balls: assemblage character

The overwhelming majority of 2016 studied clay balls were fragments. Just 13 (2.7%) were complete artifacts, with a further eight examples near complete (exhibiting a small chip or damaged portion of the outer surface (Fig. 2). Despite the high level and degree of clay ball fragmentation, the distinctive smooth outer surface, and large overall object size make even fragments of Clay objects extremely easy to recognize (Fig. 3). Almost all are fragments of carefully crafted spheres, yet this season a few exceptions to the dominant objects shape occurred (Fig. 4). Constituting less than 1% of the 2016 clay ball assemblage, in all other aspects of manufacture and finish, the four oblique spheroids resembled the large clay balls, and this were classified along with the category. Two, perfectly regular oblique-spheroid-shaped objects were recovered, one complete (22300.m101) and a second near complete (50-74% complete), (22300.m104). Both were oval in section view, slightly thicker at the bottom part than the top, with a flattened base and upper surface. In dimensions, color, fabric and finish, both were near identical. Two further similar objects were recovered, both much further fragmented, yet very clearly resembling the shape of the two examples above ((21661.m173) and (22300.m107)). Particularly clear on the otherwise smooth outsider surface, a small proportion of clay balls have impressions in the form of "twill plaited matting" impressions, n=4 (i.e. Wendrich 2005: 336, Fig. 15.5) and coiled basketry impressions, n=8 (i.e. Wendrich 2005: 334-335, Fig. 15.3 "left") (Fig. 5).

The high level of clay ball fragmentation is reflected in the weight and maximum dimensions (diameter or part therefore) of the category. Of the 628 fully studied 2016 clay balls, weight ranges from 0.05g to 712.10g, averaging at 59.61g (Table 2). Considering the complete examples only, the average weigh rises to 328.33g, the lightest being 79.40g (a complete and perfectly shaped sphere

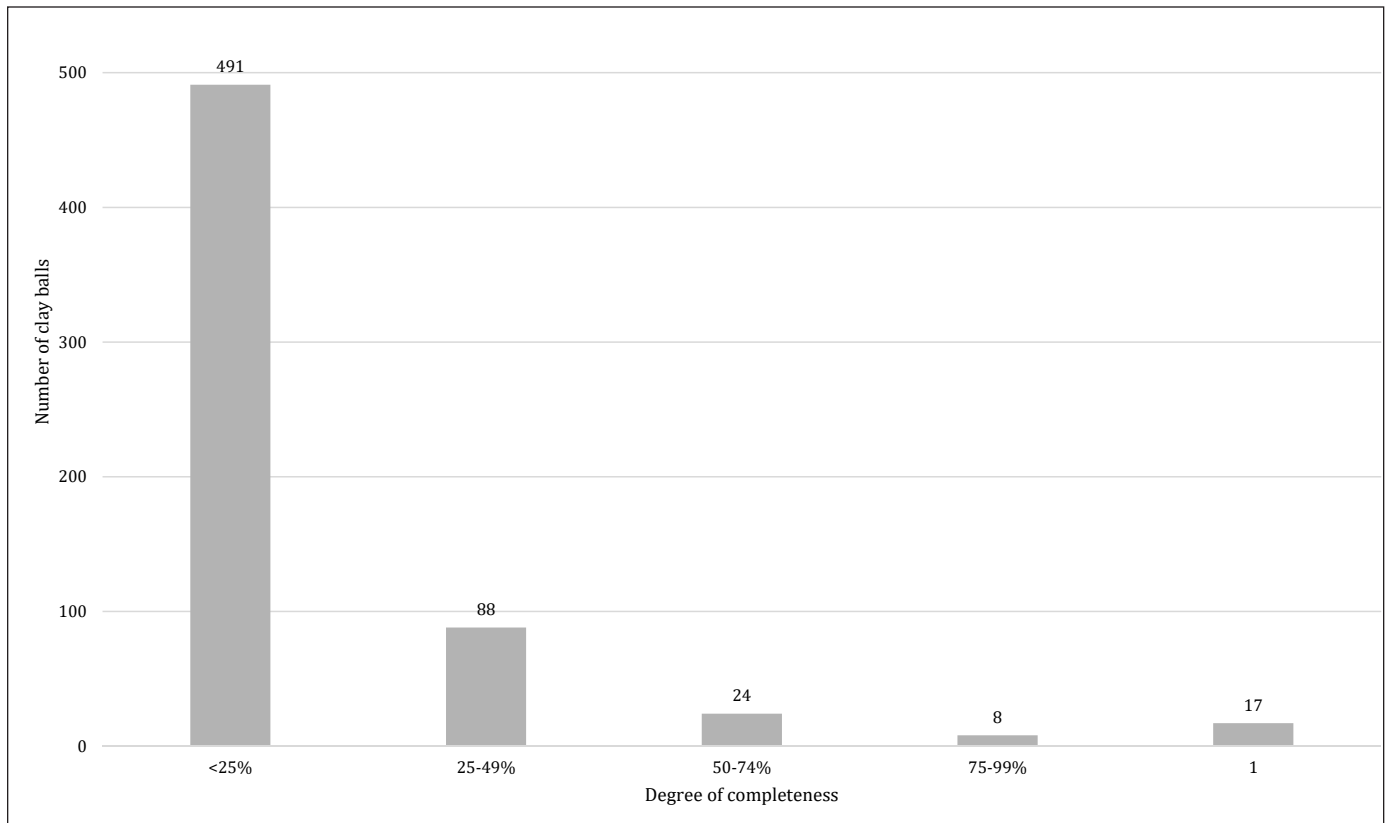


Figure 2. Object completeness in 5 tiers, of the n=628 individually and fully studied large Clay Balls in the 2016 season.

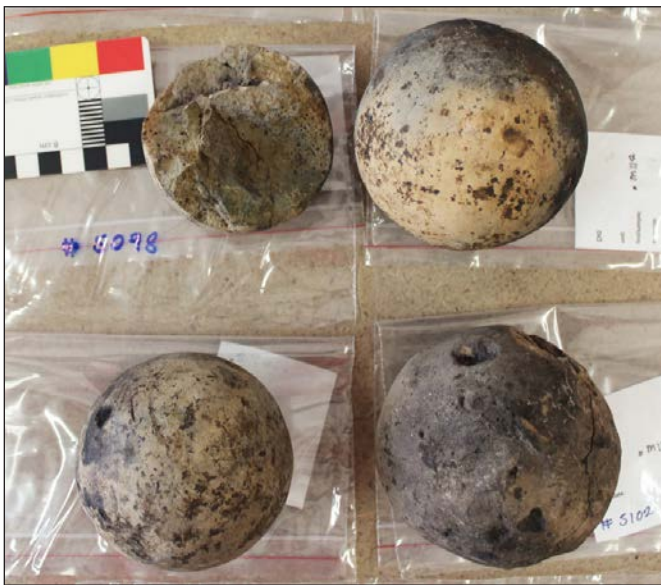


Figure 3. Example of complete nor near complete clay balls studied in the 2016 season (left to right, top to bottom: 32494.m109, 32494.m112, 32494.m110 & 32494.m113).

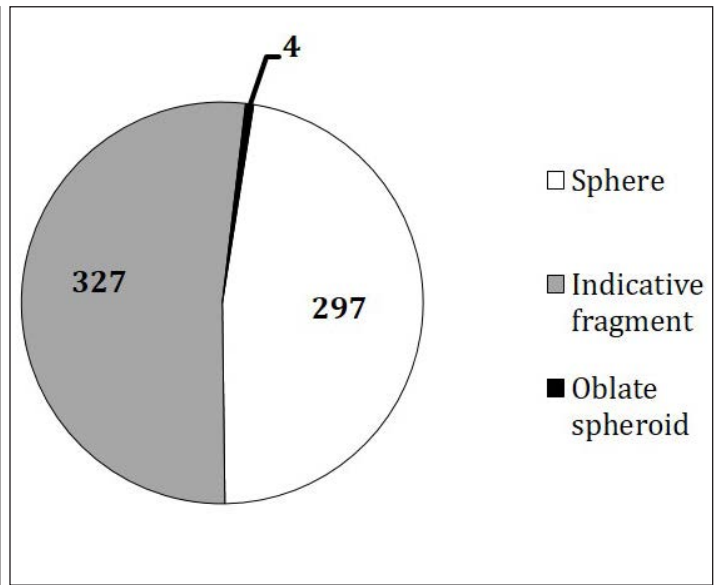


Figure 4. Shape variation seen in the 2016 studied Clay Ball assemblage. Total counts within each category are marked.

with a maximum diameter of 4.3cm). In size, the overwhelming majority of the large clay balls as the name suggests, are far larger in size than their small, geometric clay object “sphere”-shaped counterparts. Object size (maximum diameter of original outer surface finish) ranges greatly, due to the varied nature of clay object fragment size. Of the examples with a complete diameter measurement, the size ranges from 4.10-8.90cm. A complete circumference could be measured on 52 of



Figure 5. Fragment of a Clay Ball detailing impressions of twill plaited matting. Object 22351.m113 (fragment measures 6.20cm, 92.4g).

All Clay Balls (n=628)		
Range	Weight (g)	
Lightest	0.05	
Heaviest	712.10	
Average	59.61	
Weight grouping	Count	%
<10g	101	17.66
<50g	363	63.46
>100g	89	15.56
>200g	29	5.07
>500g	8	1.40
Complete Clay Balls Only (n=13)		
Lightest	79.40	
Heaviest	712.10	
Average	348.33	

Table 2. Weight range of the 2016 studied Clay Balls, all record Clay Balls and the complete examples only.

the season's clay balls. Circumference ranges from 12.00cm to 30.00cm, with an average complete circumference of 21.40cm. As with the shape classification of these objects, some exceptions with regards to size were also made, with smaller than normal objects, yet those exhibiting all of the classic, defining feature of the large clay ball objects category (in terms of manufacture, shape and surface finish), when recovered complete, were included within the category. The smaller than average clay balls are in general still significantly larger than their comparative counterparts in the small geometric clay object category (which are more crudely shaped, less well finished and less dense in feel).

A very small, yet notable proportion of clay balls had clear, intentional, decorative markings on the outer surface. Thirteen examples (2% of the 2016 studied clay balls) displayed markings, varying in form, from holes, notches and deep, seemingly intentional depressions made with the finger. One motif is found on two separate pieces: in the form of clear, deep, equally spaced, incisions in clay (as if made with a very thin piercing tool). One clay ball fragment, (31594.m103), has such markings on one



Figure 6. Clear and intentional circular holes forming a triangle shape on the surface of Clay Ball fragment 31594.m103. The face of the fragment measures 5.80 x 3.20cm. 4.30cm deep, 42.60g.

forming an equilateral triangle (Fig. 6). An identical motif is seen on complete clay ball (21661.m171). In addition to the triangle formation, the opposing side of this object displays a further, identical two holes on the otherwise very smooth surface.

Clay balls – functional interpretations and future research

One of the aims of the renewed study of the clay balls is to consider whether there is a change in their density, proportions and/or depositional practices in the earliest levels at Çatalhöyük, compared to the later levels. This question will hopefully be answered using data from the final phase of excavation (2016, 2017) at the site. All aspects of both the clay balls and smaller clay objects will continue to be studied, with the large clay balls considered for re-interpretation. Particular attention will be paid to clay ball manufacture, standardization of shape and size and weight, and the

presence of markings. Preliminary detailed analysis of object size and shape standardization suggest the creation of a very standardized and accurate spherical shape to a degree unnecessary if the main or sole purpose of these objects was to heat liquid food-stuffs. Likewise, the presence of clear, deliberate and seemingly symbolic markings on a small, yet significant number of clay balls suggests an alternative function. Finally, post-fragmentation re-use will be considered in detail, via the observation of patterning in the heavy wear of clay ball fragments, post-fragmentation burn-patterning and analysis of contextual deposition patterning according to these characteristics. The 2016 season has revealed a large number of clay ball fragments from within different construction phases of oven makeup (as seen in B.17 in the South Area).

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Support Teams

Chapter 17

Finds Lab

Lisa Guerre
AECOM

The main responsibility of the Finds Lab is to initiate and maintain this system safeguarding all artifacts and their associated records while also supporting the various research initiatives of on-site specialists. The Finds Lab functions as a nodal point in the processing of all material recovered during excavation and their registration prior to distribution to relevant onsite specialists. In addition, finds lab staff maintains the physical artifact depots working in collaboration with conservation staff to monitor proper storage conditions for the preservation of project material, manages the digital inventory, and ensures the accessibility of all material kept onsite.

For the 2016 season, the Finds Lab continued to support the North and South Areas, as well as, the TPC Area. Karolina Joka of the TPC Team joined the Lab Staff part time to assist in the finds processing. While there are no clear metrics to gauge the total volume of excavated material at the time of initial registration, it can be noted that a total of 303 x-finds were logged, with 13 items chosen as *Envanter* for final curation at the Archaeological Museum in Konya.

The Finds Officer, together with the Head of Conservation Ashley Lingle, monitored environmental data for all three storage depots with both temperature and relative humidity collected via TinyTag™ data loggers (see the Conservation portion of this Archive Report). In addition, with the help of a volunteer (Joshua Meeklah) and conservator Jerrod Seifert, additional shelving was constructed and installed in one depot to accommodate the increasing volume of oversized objects and wall painting fragments. While issues regarding available storage space were initiated in 2015 (all three depots are currently at or near capacity), the truncated season and low volume of finds negated the need to act on discard policies for both building material and unsorted heavy residue. Both policies were approved by both the Project Director and the Ministry of Culture Representative at the beginning of the 2016 season.

Due to the early closing of the 2016 season, much of the time anticipated as being available to continue with data cleaning and inventory was lost. Physical inventories and data cleaning initiatives were begun but were cut short midway and will need to be brought to completion during the 2017 season.

As always, the Finds Lab staff, along with the individual labs and specialists, will continue to strive to improve project collection management systems and efficiently and accurately contribute to the building of diverse datasets for current and future research while providing proper stewardship for all material housed on site.

Chapter 18

Conservation

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Introduction

The 2016 season was the 23rd year of the conservation programme at Çatalhöyük. While the team this year was smaller than in previous years, this season brought with it much innovation. On site work focused on the stabilisation of basal erosion and plaster surfaces. Additional work was undertaken to replace failed or aesthetically unsightly fissure fills with a more stable material. The digital monitoring program, known as the Çatalhöyük Digital Preservation Program (CDPP) continued and brought exciting new equipment and advances, this project is further discussed in a later chapter of this archive report. In the laboratory, many exciting finds from the season were carefully conserved.

Conservation of built heritage

The conservation of the archaeological substrate is ongoing and requires constantly evolving research. In an effort to be reflexive and transparent about the conservation practices carried out on site, these methods are reviewed and redeveloped from year to year.

The Experimental Capping project has been in progress since the 2010 season and a methodology was sought to coat and protect the walls. After a variety of methodologies, materials, and a great deal of research, were all attempted and none have been successful enough to continue carrying out the treatment. Much has been learned, and the basal renders are one success resulting from the project.

Additionally, since 2013 alternate methods for the treatment of fissures in the archaeological architecture have been sought, after the decision was made that the lime:sand:Primal AC-33 (aqueous acrylic emulsion) were no longer appropriate. Combinations of adhesives, perlite, and other fillers have been tested; the team also revisited the idea of using lime putty. The lime was not only difficult to successfully apply in summer environmental conditions; it also did not survive in the off-season.

Fissures in walls and sheering plaster are now in the process of being treated across the site with the use of polymers (Paraloid B44) and fillers (Perlite with soil). Paraloid B44 (methyl methacrylate and ethyl acrylate copolymer) is a thermoplastic acrylic resin that is tough but flexible once set, and selected particularly for its high glass transition temperature, which is 60°C (well above the thermal activity occurring on site). A 5% solution weight by volume in 50:50 acetone: ethanol provides adequate cohesion and rigidity, without causing issues with color change. The use of spoil directly associated with the wall being treated allows for an ideal color match, and eliminates the problem of fills visible from outside the buildings. As such, this methodology was used to create new fills this season and also replace or cover older fills (Fig. 1).

In 2013, a small number of tests were carried out to create undercutting supports for a few walls in Sp.90 and B.5 in the North Area. These supports are first lined with geo-textile, and then

rammed earth (*pisé*) is built up in the void under the wall. The tests show that not only does this stop the undercutting, it also slows the deterioration of the wall. The geo-textile barrier helps to control the moisture ingress and mitigates the issue of soluble salts. As this methodology appeared to be successful, it was more broadly applied across the site in 2015 in Buildings 64 and 55, and Spaces 240, 161, 162. In 2016, Buildings 48, 82, 49, 4, 5, and Space 60 were all treated. Renders from previous years were checked and retouched as necessary.



Figure 1. (left) Wall F.4090 in 2014; (right) wall F.4090 after retreatment in 2016.

As the application of the earth renders has increased, the methodology is continuously being reviewed and refined. As part of this process, Chloe Pearce, undertook a small research project looking at spoil sourcing, mechanical properties, and color matching during her time on site. Two sample studies were carried out in both the North and South Areas. While it has previously been identified that using spoil from the wall being treated is ideal for color matching, there is not always enough spoil available. Subsequently, spoil from elsewhere must be sourced this can result in an unpredictable results once dry. In the North Area particular attention must be paid to soil from burnt areas, as this impacts both the physical properties and causes the earth render to dry a distinct grey brown shade.

Color matching earth renders

Chloe Pearce

Earth renders have been in use at Çatalhöyük for a number of years, to minimise the impact of basal erosion along the base of the walls. The results often do not match the surrounding mudbrick in color. This year, research was carried out into the predictability of the color of the earth render, with readings taken from the Munsell Soil Color Chart. The tests were undertaken in Sp.60 in the North Area, and Spaces 161/162 in the South Area. In both cases, an attempt was made to select soil that would follow the projected pattern set out by B.5. It was not always possible to find soil of the desired color. As seen in Table 1, the ideal color was never achieved. However, the difference in color value did not reflect a significant difference *in situ*. The earth render consists of two parts soil, with one of perlite, sieved straw and water. The ideal consistency is a highly viscous thixotropic liquid. This allows it to be worked and adhered sufficiently to the geotextile and surrounding wall.

Building	Aim	Soil	Soil and Perlite	Final Wet Mixture	Dry Mixture - 24 hours
Building 5, North Area	4/3 7.5YR	3/3 10YR	5/3 10YR	3/3 10YR	6/2 10YR
Space 60, North Area	7/3 10YR	5/3 10YR	5/4 10YR	2.5/2 7.5YR	6/2 10YR
Space 161/162, South Area	5/4 10YR	5/3 10YR	6/4 10YR	4/3 7.5YR	6/3 10YR
Space 161/162, South Area	5/4 10YR	6/4 10YR	6/3 10YR	4/3 10YR	5/3 10YR

Table 1. Color reading at different stages of the earth render.

The process was run through to sample the kinds of color changes to be expected with B.5. This demonstrated that the addition of the perlite caused the color to become significantly lighter, which only became more pronounced as the mixture dried on the wall (Fig. 2). From this evidence, it was predicted that it was necessary to collect soil with a chroma value two less than the color being aimed for.



Figure 2. (left) F.1612 before application of earth render; (right) F.1612 after application of earthen render.

An unforeseen result of selecting the soil simply for its color was to forfeit the working properties. To produce the best results, soil with high silt content was preferable, as it gave the render clay-like properties. Soil with lots of stones and a coarser content took longer to sieve and did not produce render with the ideal working properties. This also caused the final appearance to be sub-standard. Although only a small amount of research was carried out, it does suggest that the impact of the perlite and drying process can be predicted. Further research is needed for a standard to be developed.

Environmental monitoring

During the 2015 season a site wide implementation of TinyTag™ environmental data loggers was put into place. The data collected in the off-season shows a wide range of temperature variations from -14°C to 48°C within both shelters. This extreme fluctuation over the course of the year is another factor in the deterioration of the site, specifically relating to both annual and diurnal moisture and salt cycles (see 2015 Archive Report).

North Area

At the beginning of the season there was a large amount of debris in the shelter that needed to be removed due to the dry and windy conditions in the off-season. An additional assessment of the shelter was carried out as further issues with condensation and moisture ingress were actively damaging the shelter structure. As previously reported, the North Shelter has many issues that negatively impact the preservation of the *in situ* archaeology. As time did not allow for review that was more extensive or repairs of the shelter, a few modifications were made to prevent moisture ingress in the off-season. An additional clear barrier was positioned across the soft flapping on the internal face of both the west and east sides. Where necessary the exterior cords were replaced to hold the flaps down. Additional sandbags were placed around the exterior and interior of the perimeter.

South Area

Along with supporting the excavation work in the South Area this year, one of the biggest undertakings by the conservation team was the removal of F.5014, the geometric wall painting from B.80. The wall painting was taken in three sections, over the course of three successive days (Fig. 3). The painting was partially conserved during the 2016 season, including stabilization and backing. During the 2017 season, further work will be done to the front of the painting before it is taken to the Konya Museum.



Figure 3. (left) F.5014 before removal ; (b) F.5014 after removal.

Laboratory work

The lab processed 44 small finds in the 2016 season. The finds include: shell, painted plaster, lithic material, clay objects, textile, baskets, glass, metal, and work and un-worked faunal material. A particularly challenging object this year was a wooden bowl was discovered in (30092). The most notable small finds conservation worked on during the season included: the cinnabar skull and stone mace head from B.5, and finally two stone figurines from the TPC Area.

Acknowledgements

Thank you to the Çatalhöyük Research Project Team for another season of fantastic collaborative work. A special thank you to Gesualdo Busacca, it was a great experience having you work with the team.

Chapter 19

Heavy Residue

Milena Vasić
Freie Universität Berlin

This year, the Heavy Residue team consisted of Jovana Tripković, Karolina Joka and Milena Vasić. The samples were sorted by Şenay Yaşlı, Hatice Tokyağsun, Fatma Eken, Fadimana Sivaz, Emine Bülüç, Saliha Sivaz and Gülay Eken.

In total, 520 heavy residue samples (12,337 liters of soil) have been fully processed this season. These samples consist of 240 samples (including 118 samples from the priority units) from 2016 and 280 samples that were stored as a backlog at the end of the last season (Table 1). In addition to this, GDN samples from the previous two seasons were fully processed this year. The backlog for the next season comprises 212 samples from the TPC Area, 142 samples from the North Area and 128 samples from the South Area.

Area	Excavation year	# of samples processed in 2016
GDN	2015	47
North	2015	107
North	2016	166
South	2015	76
South	2016	72
TPC	2015	49
TPC	2016	3

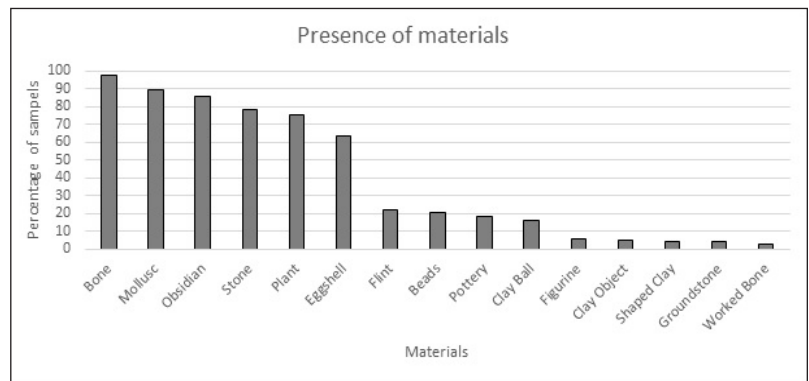


Table 1. Number of samples processed in 2016.

Figure 1. Percentage of samples containing each type of material.

The fully processed samples from this year show the usual occurrence of materials at Çatalhöyük. Bone, mollusc, obsidian, eggshell, stone and plant are generally considered to be ubiquitous on site, being usually present in the majority of the excavated deposits (over 80%). However, similarly to the previous couple of years, the analyzed samples from this year show a relatively lower presence of plant, stone and eggshell (Fig. 1).

Animal bone was absent from only 12 samples, eight of which had been taken from B.131. Construction/makeup/packing and floor deposits had the lowest density whilst the samples from fills and midden deposits had the highest density of bone, especially the midden deposit (32114) (Grid 9, 11 and 15) in the external space Sp.610 in the North Area. Several deposits from the GDN Area also contained a high density of bone, particularly units (22868), (22850) and (21403).

Obsidian density is similar in the floor, fill, activity and construction deposits, whilst the highest density is evident in the midden deposits. Out of 73 samples that did not contain any obsidian, 20 samples are from B.80 and 25 from B.131. However, two burial fills from B.131, (30038) and (20678), contained a high density of obsidian.

The highest density of eggshell is witnessed in three burial fills ((30091), (30092) and (22678)) in B.131 as well as two midden deposits ((32101) from Sp.85 in the North Area and (22351) from Sp.583 in the South Area).

Samples from three midden deposits (22344), (22351) and (22343) in Sp.583 and a building infill (22355) of B.118 contained the highest density of mollusc.

A burial fill (19140) in B.80, a burial fill in B.17 (22513) and a midden deposit in Sp.85 ((32106), Grid 15), as well as two deposits from the GDN Area (22843) and (22868) had the highest density of flint.

As expected, units that were rich with pottery were all from the GDN and TPC Areas, which belong to the late occupation of the settlement. On the other hand, surprisingly, units with the highest density of pottery in the North and South Areas are three burial fills (22678), (32040) and (19140), as well as a midden deposit (32106) (Grid 15) in space Sp.85. A high density of different materials, and especially pottery implies that the deposition of the material in these burial fills was tertiary.

There is a great variation of the deposited material in the burial fills. Apart from a relatively high density of flint in the burial fill (22199), all four burial fills from B.5 contained a low density of material. Similarly, two burial fills from B.48 and a burial fill from B.114 show a low density of all materials. Three burial fills in B.129 contained a low density of material, with the exception of a high density of bone that was noted in (22676) and a high flint density in (22623). Building B.132 also shows a similar pattern. Burial fill (32040) contained a high density of bone and stone, but the density of all other material was pretty low in comparison to the other burial fills from this year. On the other hand, burial fills in building B.131 seem very different from the other burial fills in the North Area. Each of the 11 samples from the burial features show a high density of at least one material. Unit (22678) contained a high density of all frequent materials. This unit, together with (30036), is the only burial fill that had a high density of mollusc. Apart from fills (32320) and (22678), other units had a low density of bone.

The majority of burial fills in the South Area also had a relatively low density of the frequent materials. A high density of stone was noted in one burial fill (22396) in B.160 and three burial fills (19157), (21214) and (19142) in B.80. The only burial fill with a high density of animal bone is unit (19142). Apart from stone and bone, this fill also had a high density of obsidian. All burial fills in B.80 contained a low density of mollusc and eggshell. On the other hand, burial fills in B.17 had a high density of mollusc. With the exception of (22515), burial fills from this building all contain a relatively high density of plant and bone.

As mentioned in the previous archive reports, density for artifacts such as objects made of clay, worked bone and beads made of various materials, is calculated as count per liter (as opposed to ubiquitous materials whose density is calculated as gram per liter).

Units (22343) and (22344) in Sp.583 and (32431) and (32468) units in B.160 have the highest density of clay balls (>0.4 fragments per liter). Figurine fragments (N=59) were found in 31 samples. Five fragments of figurines were recovered from one of the samples from a midden deposit (32106) (Grid 14) in Sp. 85.

Bone artefacts that were found in the samples include finger rings and one bone point. A complete bone point was found in a burial fill in B.160 (32403). One complete ring and 12 fragments were retrieved from eight units. A complete bone ring and three fragments of another ring were

retrieved from a burial fill in B.131 (22675). A fragment of a ring was found in another burial in in B.131 (22676).

This year, 1,180 beads were recovered from 103 units, a third of which are burial fills. Beads were recovered from almost 70% of the processed burial fills this year, however 17 (out of 34 burial fills in total) contained only one bead. On the other hand, the majority of beads (N=756) come from burials in B.131. The highest density of beads (1-3 beads per liter) was witnessed in three burial fills in B.131 ((30036), (30038) and (22678)), two burial fills in B.77 ((22623) and (21682)) and one burial in Sp.76 (22619).

Two units of a relatively small volume (less than 30 liters) contained an unusually high amount of beads (more than 10). Twelve stone and one shell bead were recovered from a floor in B.80 (22421), whilst a construction/makeup/packing deposit in the same space (22425) contained 19 beads.

This is just a brief overview of the samples that were processed this year. These samples represent 14.5% of the flotation samples taken since 2009 that will be fully analyzed next season.

Chapter 20

Paperless Revisited: New Developments in Digital Recording

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The ongoing efforts to implement a 100% paperless documentation system began in 2013 with a focus on digital graphic recording in the field. As access to the server became available on site in 2015, this effort to “go digital” was extended to all aspects of on-site recording, which was utilized by some excavation teams for the purpose of testing and fine-tuning. This goal has been fully achieved with the 2016 season, as digital on-site recording is now used by all excavation teams, as well as specialist teams such as human remains. As a result, the use of tablets as the chief on-site recording implement was successfully carried out on all levels; and all excavators, regardless of respective technological background, were able to use the tablets to record excavation data effectively (Fig. 1).



Figure 1. Field director Burcu Tung uses a tablet to record archaeological features in Building 131 (photograph by Jason Quinlan).

A number of minor issues arose throughout the 2016 season, which we will briefly address in this report. The expansion of the role of the tablet on-site also meant that there was a potential for bottlenecks in the workflow, especially for larger excavation teams. This problem was partially mitigated through the acquisition of additional tablets so that individual excavators each had their

own implement. In terms of physical stability, the tablets fared relatively well. One of the biggest issues facing the excavators when using the tablets was dealing with occasional electrical blackouts, which rendered the server unusable for (short) periods of time.

Previously established workflows remained largely unchanged, although some experimentation was conducted concerning the recording of elevation and section drawings using various software such as LibreCAD, AutoCad and Adobe Illustrator. Although eventually the use of ESRI's ArcMap for section/elevation drawings was retained for several reasons, the main problem identified lies in the lack of (widespread) access to and familiarity with CAD-applications and Illustrator on-site. This experience underlines a common fact, that digital workflows in archaeology are highly dependent on a general availability of software solutions and are nearly never developed by archaeologists themselves. As GIS applications have become a standard methodology in archaeological research, the necessary knowledge on how to use this software can be assumed to be generally available for all excavators. Contrary to this, CAD applications have never entered the general public and therefore it seems archaeology in general struggles strongly with the documentation of elevation in a standardized way. In consequence, ArcMap does actually seem to be the best solution for the moment.

However, several issues in the way sections are recorded and integrated in the geodatabase still need to be addressed. Primarily, the use of images extracted from the 3D models created on site to trace sections remain problematic; once these images are exported from the 3D model they lose their spatial reference and in order to be properly used in a GIS environment they need to be georeferenced again. This creates an additional step in the work flow and makes section drawing more complicated. However, digitizing images not linked to a geographic coordinate system generates "floating" sections that are difficult to reposition and are not properly integrated within our dataset. While using ArcScene could partially solve this problem, there is no easy drawing tool and it would require the use of another piece of software that is not as largely used as ArcMap. We hope to address these issues next season in order improve the integration of section data.

As a next step for the graphical documentation on site, the direct integration of on site documentation into the centralized storage seems to lie at hand. While the geodatabase for now is deployed as local copies to each tablet and then reintegrated to a unique version on the server in frequent intervals - especially at the end of the season - connecting all tablets to a central database at all time should make data integration more effective. This year, the accessibility of the server on-site allowed experimentation with direct data entry into the central geodatabase (ESRI ArcGISServer), which also proved effective.

In an overall perspective, as 2016 being designated as the last year of excavation of the Çatalhöyük Research Project, it was the intention for most MS Access frontends to reach a final version of development. With the change of plans because of the political turmoil, minor modifications may continue to occur throughout next year's campaign, but in general the database frontends will not see major modifications after the end of the 2016 season. Development of the frontends can be summed up in three categories: new datastructures, major modifications to recording methodologies, and minor changes or bug fixes.

Primarily, the necessity to integrate datasets that are not yet included in the central database made it necessary to develop four new sets of database tables and frontend applications. This data had been processed on the basis of spreadsheet applications and their integration on the central

database server will aid the completion of data integration awaiting the project towards the end of the research lifecycle.

A datastructure for anthracological studies was developed together with Ceren Kabukcu. The groundwork were spreadsheet documents from the prior work done by Eleni Asouti and her own studies at Çatalhöyük. The frontend allows for the ingestion of basic data, single specimen and data from hand picked samples. While on the basic examination level only the quantification of various taxa is possible, single specimen analysis allows for the storage of more than 15 attributes for each taxon.

The development of a new Clay Objects database had been in the making for some years and it was finally possible to complete new data entry functionality for small and large clay balls, using a new methodology and terminology developed by Lucy Bennison-Chapman. Analysis is structured in a first and second examination level. While the first level only allows for the storage of basic information, the second level includes detailed determination of shape, dimensions, markings/decorations, fabric, inclusions, manufacture and post-production.

A third new set of tables has been developed for the Chipped Stone Database. Sean Doyle is analyzing material following two stages, a first one allows to determine basic information on un-worked objects and a second stage to examine worked objects. In the second stage it is for example possible to distinguish debitage categories, different production indicators, tooltypes for multiple usage scenarios or the detailed documentation of multiple faces for each object.

Additional to the inclusion of data on distinct analysis types, the need for transversal datastructures has come up. These datastructures are defined by the need of being interconnected with a certain number of existing tables on the database. These transversal structures are not used to store data in the context of a specific research discipline (e.g. human remains, faunal remains, anthracology, etc.) or a specific object type (groundstone, chipped stone, etc.), but they refer to information that is already stored in those specific tables and they link additional data to them. A first example for now is the newly developed Beads Database. As beads are produced from material that is being analyzed within other research contexts, but the actual manipulation of the material to produce a bead is not or only superficially stored yet, this database links to basic information from the Finds Register, Groundstone, Faunal Remains and extends this information with detailed determination of material, quantification, color, perforation, production and usewear.

Because of the early departure from site, the planned development of an extension for the Conservation database has not been possible and will be finalized in the next months. Ashley Lingle is cooperating with Nicola Lercari and the University of California, Merced to develop a smartphone application which can be used to examine detailed environment and 3D modeling data on site. For now a new set of tables have been conceptualized, which will allow for the recording of the data that can then be visualized within the application.

Besides new developments or minor bug-fixing, major modifications and addition of new features has been implemented in the following databases:

- In the Human Remains Database it is now possible to generate automated skeleton visualizations based on the textual quantification of bone remains. The images are exported in SVG-format and are then automatically converted into the JPG-format on the central server (Fig. 2).

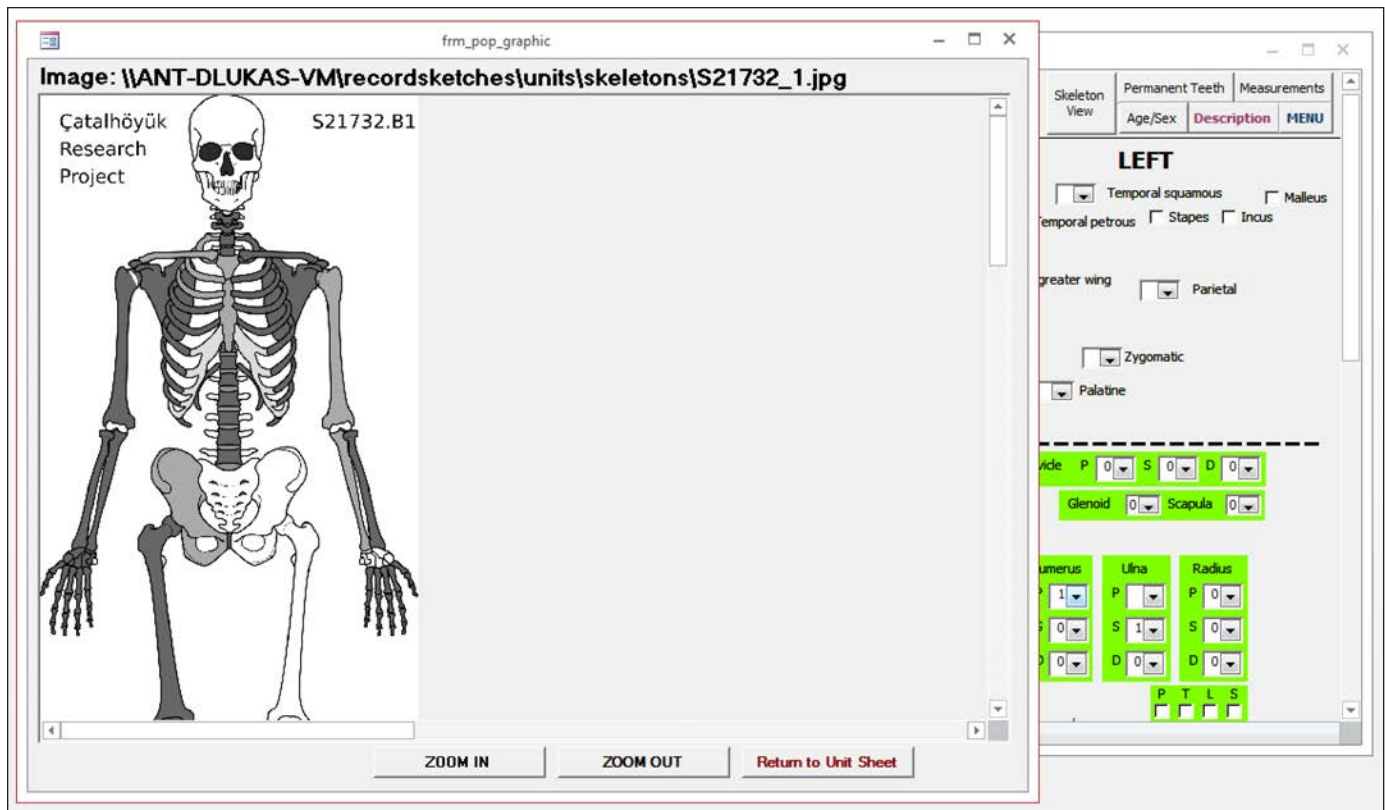


Figure 2. Screenshot of automated skeleton visualization generated from Human Remains database skeletal inventory.

- The Photo Logging Database, which has been developed last season, now performs consistency checks with the Extensis Portfolio Photodatabase, with which the photolog needs to be integrated. Also a search filter for names of photographers and dscn-numbers has been added.
- The Priority Unit Database has been extended by adding summaries from the new anthracology and clay objects database, as well as the previously not included human remains database.
- Finally, the Excavation Database now links to building and space sketches stored on the fileserver. Furthermore, the status screens (for checking consistency of data entry), which had been developed last season, now allow for easier navigation in between unit/feature status lists and the unit/feature sheets to check.

Chapter 21

Site Visualisation and Presentation

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Introduction

This year – our 8th consecutive year as part of the Çatalhöyük Research Project – the Visualisation Team converged on site earlier than previously (late June) and for a briefer period (16 days in total). Owing to our tight timeframe, our tasks were focused and, in most cases, defined in advance of our arrival. As detailed below, these included creating new social media content for the Facebook and Twitter pages – following a model established in 2015 wherein we prioritize biographical-style presentation which brings attention to the many people and teams working on site. Updating of existing website content. Development of a series of new blog posts to be published monthly, ending mid-summer 2017. The creation of a new family-oriented trail around all visitor-accessible zones of the site, including the Visitor’s Centre, Experimental House, North and South Areas. Addition of a series of new and replacement displays for the Visitor’s Centre. Prototyping of an on-site digital media application for visitors to Çatalhöyük with mobile devices. Experimentation with trowel’s-edge video-game development, led by Tara Copplesstone in relation to her PhD research. Edits to the interactive panels added to the Experimental House in 2015. More detailed planning of the internal features, external features and interpretative signage for a set of four near-full-sized Çatalhöyük replica houses, whose construction began on site in 2016. Minor updates to the Turkish version of the Site Guidebook, and commissioning of its reprinting through our sponsors at KOP. We also continued with our ongoing visitor research (including study of visitor log books, surveys with observations of and informal interviews with visitors).

Importantly, in May, we received the phenomenal news that our three-year €2.6-million Euro grant application to the European Commission’s Horizon 20/20 scheme was successful, and is now set to launch in November 2016. The project, entitled EMOTIVE, brings together eight institutional partners from six different countries, working at two main UNESCO sites, Çatalhöyük and the Antonine Wall/Hunterian Museum in Scotland, and in concert with a variety of affiliated locations (e.g. Athenian Agora in Greece, Giza Pyramids in Egypt, Piazza del Duomo di Pisa in Italy, Imperial War Museums in the UK). EMOTIVE aims to research, design, develop and evaluate methods and tools that can support the cultural (museums, archeological sites) and creative industries in creating virtual museums that draw on the power of ‘emotive storytelling’ (storytelling that can trigger visitors’ emotions). Given that EMOTIVE is centered primarily around research at two UNESCO sites, it provides us with a unique opportunity to use heritage interpretation to examine the rhetoric that they are ‘universally’ important: i.e. that we recognize these sites as belonging to the collective ‘us’, and relevant to all of humanity. Using ubiquitous narrative tropes (mystery, romance, comedy, etc.) delivered across continuous exhibition platforms (connected mobile, desktop, and related ‘smart’ devices), we aim to investigate the real social promise of ‘universal’ forms of cultural heritage interpretation for connecting people across time and space. Early planning for EMOTIVE began on site this year in conversation with Ian Hodder, and the first of a series of development workshops will be hosted in York in early 2017.

In total, we had a core team of seven people present at Çatalhöyük this year: six from the University of York (Sara Perry, Ian Kirkpatrick, Katrina Gargett, Izzy Bartley, Tara Coplestone and Dena Tasse-Winter), one from Ege University (Burcu Demir), assisted by the Çatalhöyük Research Project's Ali Kavas and Bilge Küçükdoğan (Fig. 1). Together we represent a mixture of lecturers, PhD students, recent graduates, and independent graphics and technology specialists.

As always, our practice is grounded in rigorous data collection which provides an empirical foundation for every initiative that we pursue at Çatalhöyük. We are committed not only to such evidence-based work, but to a reflexive, sustainable approach that is defined entirely collaboratively and in equal partnership between Turkish and foreign team members.



Figure 1. The Çatalhöyük Visualisation Team, clockwise from top left: Burcu Demir, Sara Perry, Tara Coplestone, Izzy Bartley, Ian Kirkpatrick, Dena Tasse-Winter, Katrina Gargett, Bilge Küçükdoğan and Ali Kavas (photo by Jason Quinlan).

Çatalhöyük visitor demographic report

The site guards have been collecting both national and international visitor demographic data since 2002, in a series of handwritten notebooks. Each year our team takes on the task of reviewing, collating and digitizing this data. This was started in 2013 by Erica Emond, and was taken over in 2015 by Katrina Gargett who, this year, has worked with Turkish team member Burcu Demir to compile all figures until June 2016.

2016 presents the first year where numbers have been double-checked after input (hence increasing their reliability). The various data, particularly up to the end of 2015, hint at interesting trends. Firstly, 2015 recorded the highest number of visitors of all time, with 20,859 people coming to Çatalhöyük between January and December (Fig. 2). Visitor numbers have been consistently rising since 2011, with a minor drop in 2014 (Fig. 3). The data from January – June 2016 indicate that this trend might be set to continue, with approximately 900 more visitors than the previous year

during the same period (Fig. 4). However, the effects of the recent coup and terrorist attacks on major venues in Turkey (including Ataturk Airport) will presumably have an impact on visitation.

Overall, the data are promising, especially given that numbers fell by over 1000 for this period in 2015 (Fig. 5). We are hopeful that visitor numbers will remain above the 20,000 mark for the 2016 calendar year. Interestingly, seasonality has altered slightly with 2016 seeing a peak in visitors during the month of April, rather than May (Fig. 6). This is only the second occurrence of such a trend, with 2010 being the only previous year for an April peak. However, average monthly numbers for 2015 have again not reached above 3,500 visitors, as seen during May 2013 (Fig. 7).

Most significantly for 2015, there has been a marked decrease in the number of international tourists, whilst the number of national visitors has continued to rise (Fig. 8 – also see Fig. 2). National visitors now outweigh international visitors by approximately 80-85% to 20-15%. For the January through June period, the site received approximately 50.2% fewer international visitors in 2016 than 2015, and 60.5% less than in 2014. Accordingly, 2016 has seen the lowest recorded international figures in at least 6 years for this 6-month period (Fig. 9).

On the other hand, there was a 26.13% increase in the number of national visitors across this timeframe (Fig. 10). This follows the patterns observed during 2014 and 2015, and we predict that international numbers will continue to fall to those levels seen prior to Çatalhöyük's UNESCO World Heritage inscription in 2012. The causes for such decline are likely diverse, and it is a matter of concern for us to continue monitoring and researching probable contributing factors over the next year. A review of Çatalhöyük's visitor trends in line with Turkey's wider touristic trends is planned by Katrina Gargett, with an intended completion date before the 2017 field season in order to inform our future interpretation activities.

The national visitor demographic remains consistent with previous years, with Konya providing the most tourists, followed by Istanbul and Ankara respectively. The 2015/16 international visitor demographic also remains consistent (Fig. 11). Japan, the USA, and Australia continue to rank the highest amongst the top 5 nationalities. Indeed, Australia moved into the top 3 in 2015 for the first time, overtaking Germany (Fig. 12). The January through July 2015 data suggested that the USA would become the top nationality for 2015, however the site received 636 Japanese visitors in the latter half of the year, totaling 1,120. This visitation level from Japan amounts to 266 people higher than total number of visitors from the USA in 2015 (which numbered 854), meaning Japan remains the leading visitor demographic at Çatalhöyük since 2013. The 2016 data thus suggest that this trend is set to continue (Fig. 13). However, the peak of Japanese tourists in 2012 (presumably in connection with Çatalhöyük's UNESCO inscription) continues to fall, as predicted in previous reports and according to general trends.

As with previous years, it is important to note that there remain some inconsistencies with the site guard totals and the totals counted by our team. It is still unclear as to why such inconsistencies present themselves, and again, all data would benefit from double-checking in the future. This year has mirrored previous years with the totals suggesting divergences in counting by about 1 to 38 people per month. Both May and August 2015 present more anomalies, with the site guard totals counting around 341 and 487 people less (respectively) than our own totals. The handwritten nature of the recording process may be a substantial contributing factor to such inaccuracies. It is advised that a review of the process takes place in order to help minimize these differences in the future.



Figure 2. National and international total visitor numbers, 2010 - 2015 (data compiled by Katrina Gargett and Burcu Demir).



Figure 3. Comparison of total visitor numbers by year, 2010 - 2015 (data compiled by Katrina Gargett and Burcu Demir).

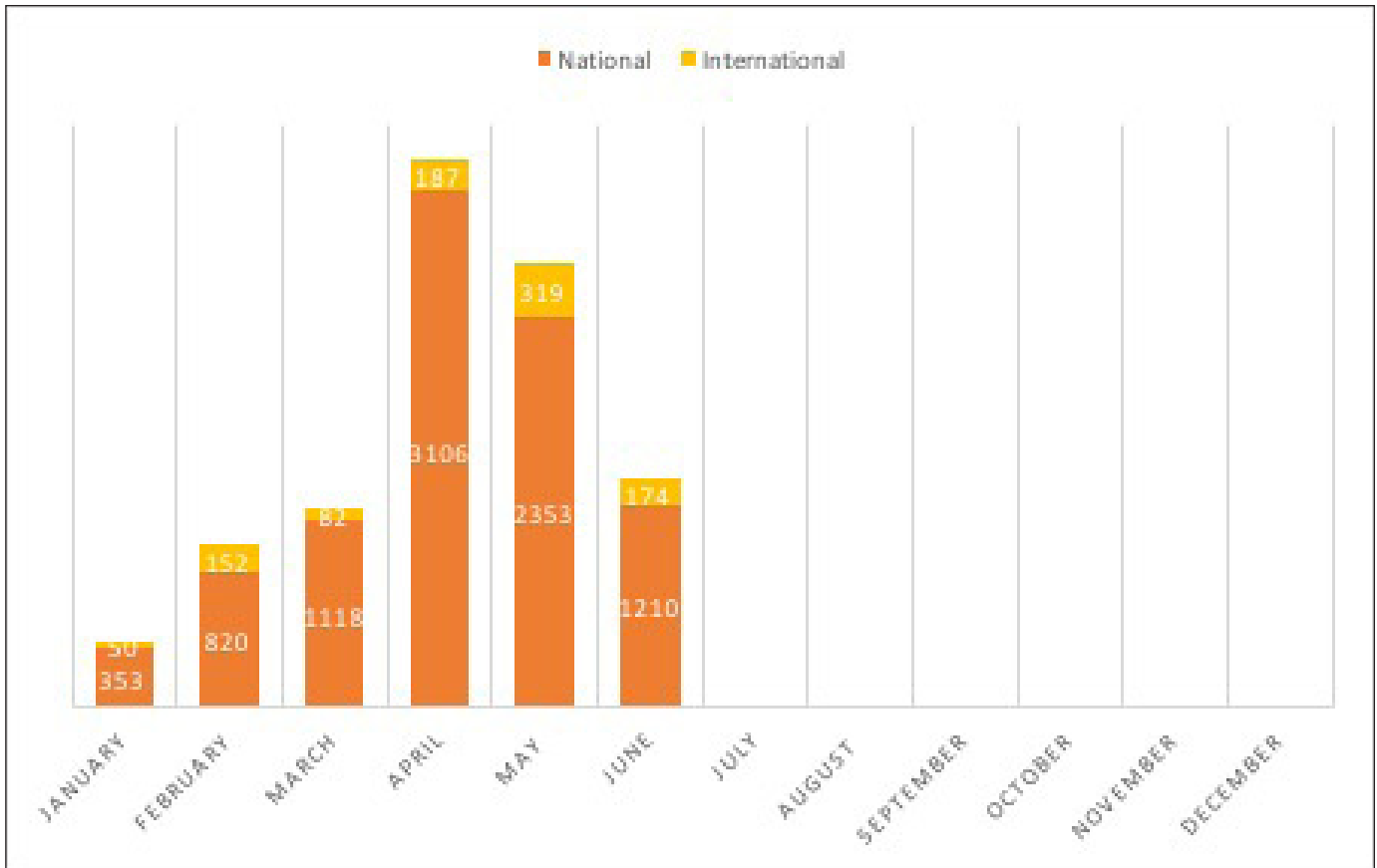


Figure 4. Visitor numbers by month, January - June 2016 (data compiled by Katrina Gargett and Burcu Demir).

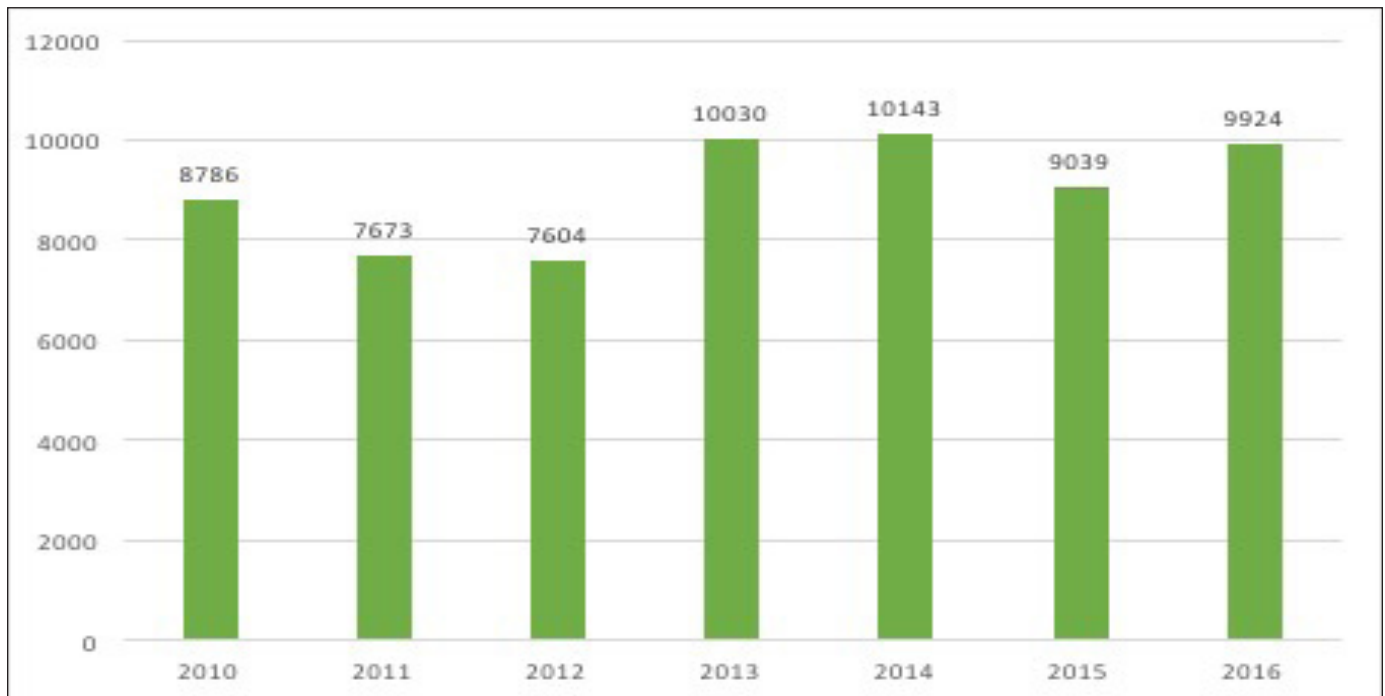


Figure 5. Total visitor numbers for the period January – June, 2010 - 2016 (data compiled by Katrina Gargett and Burcu Demir).

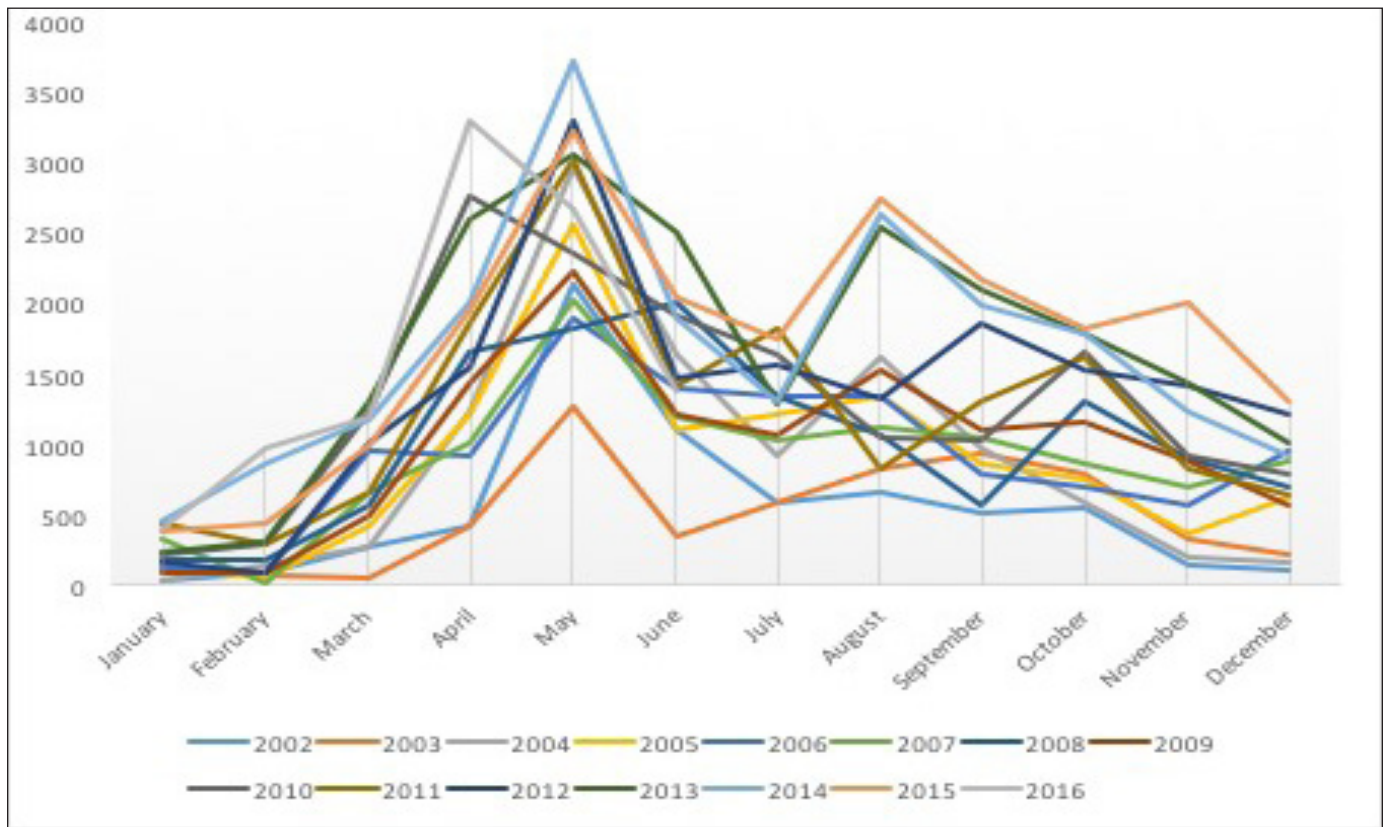


Figure 6. Comparison of visitor numbers by month, January 2002 - June 2016 (data compiled by Katrina Gargett and Burcu Demir).

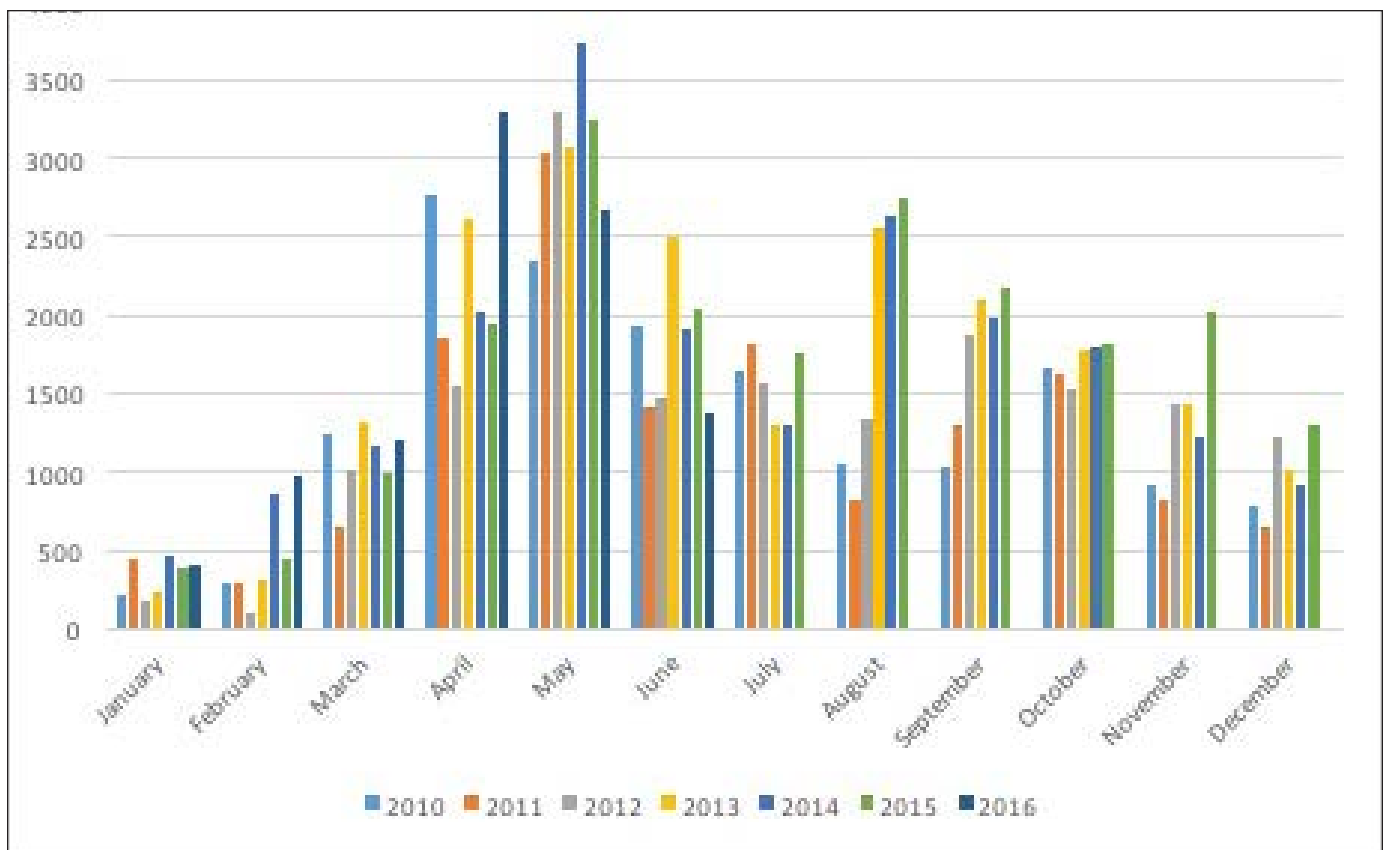


Figure 7. Visitor numbers by month, January 2010 - June 2016 (data compiled by Katrina Gargett and Burcu Demir).

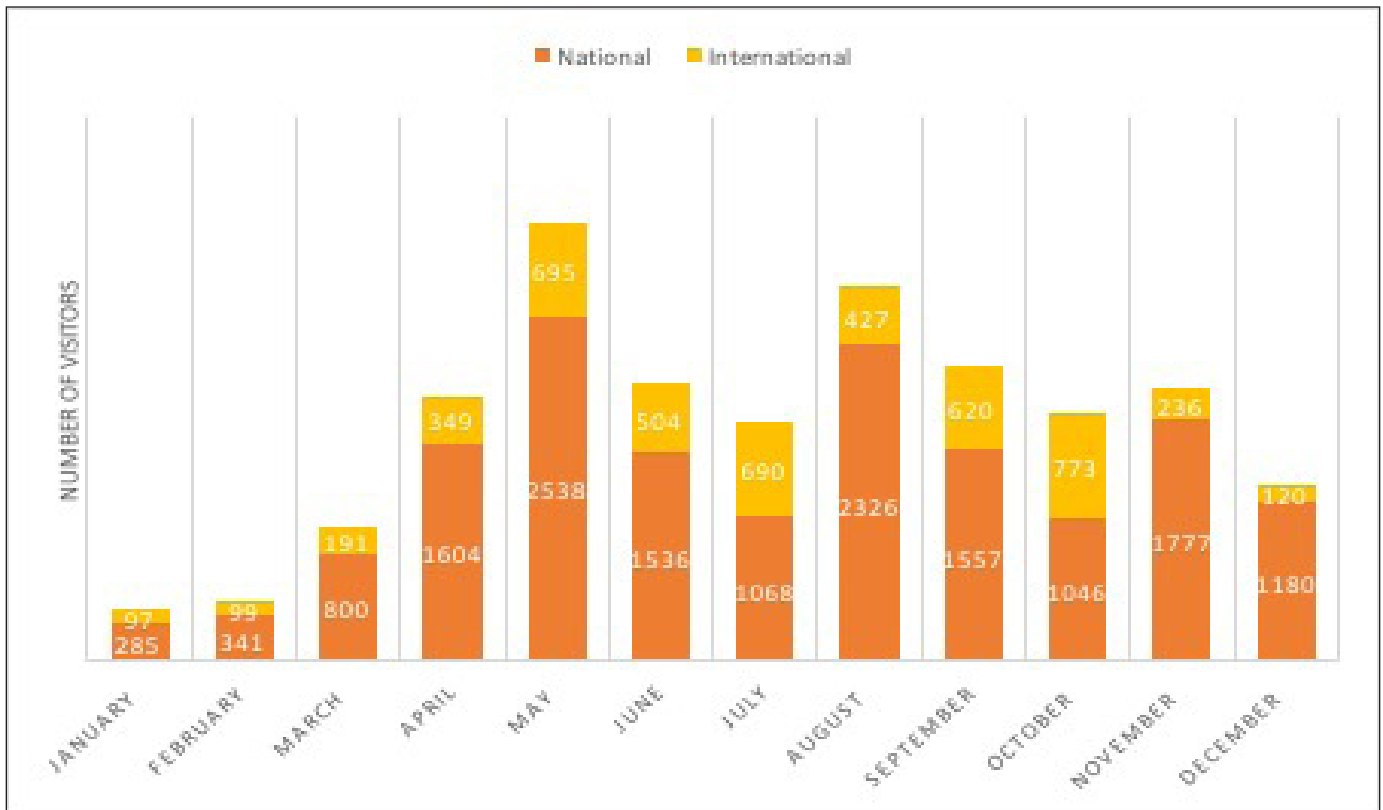


Figure 8. International and national visitor totals for the 2015 calendar year (data compiled by Katrina Gargett and Burcu Demir).

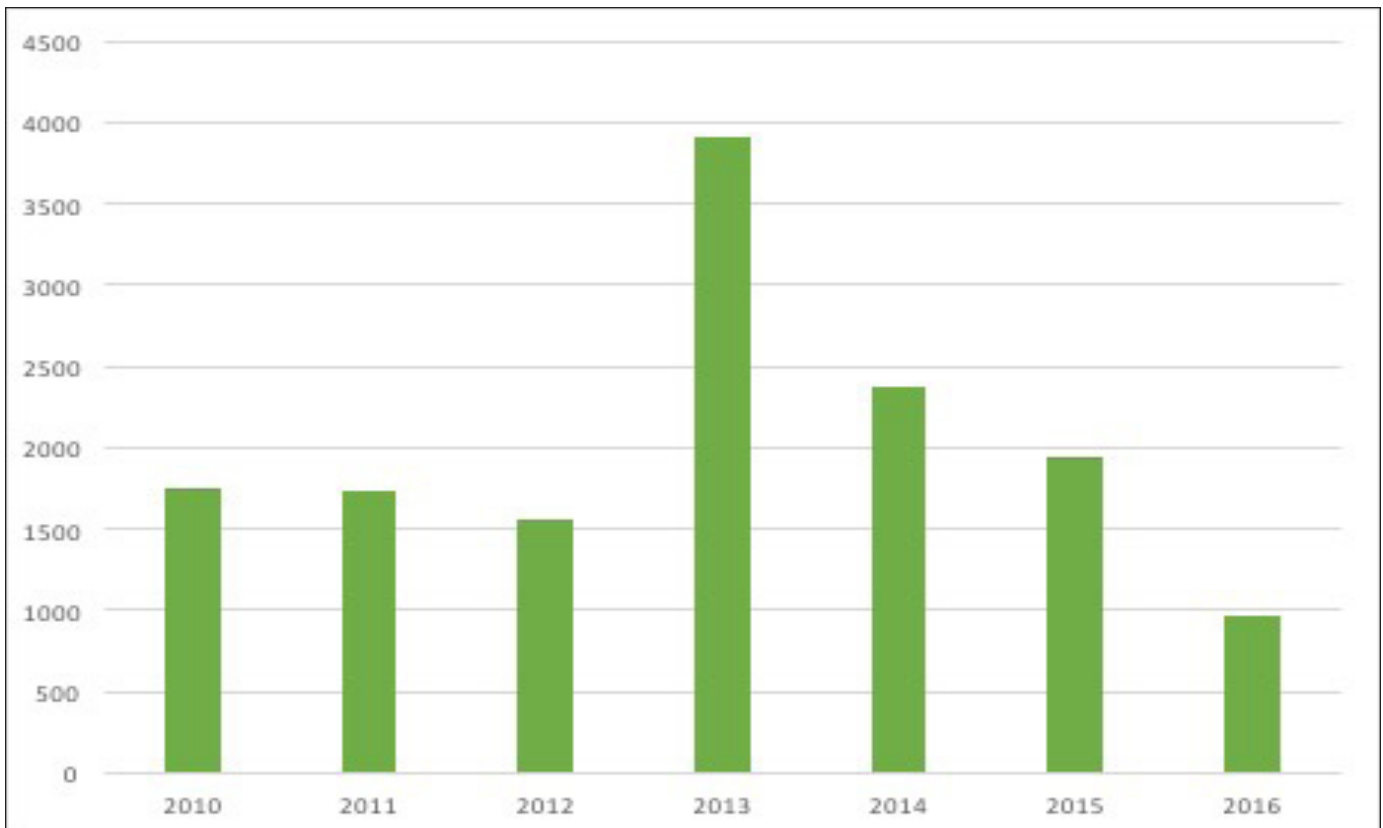


Figure 9. International visitor numbers for January – June, 2010-2016 (data compiled by Katrina Gargett and Burcu Demir).

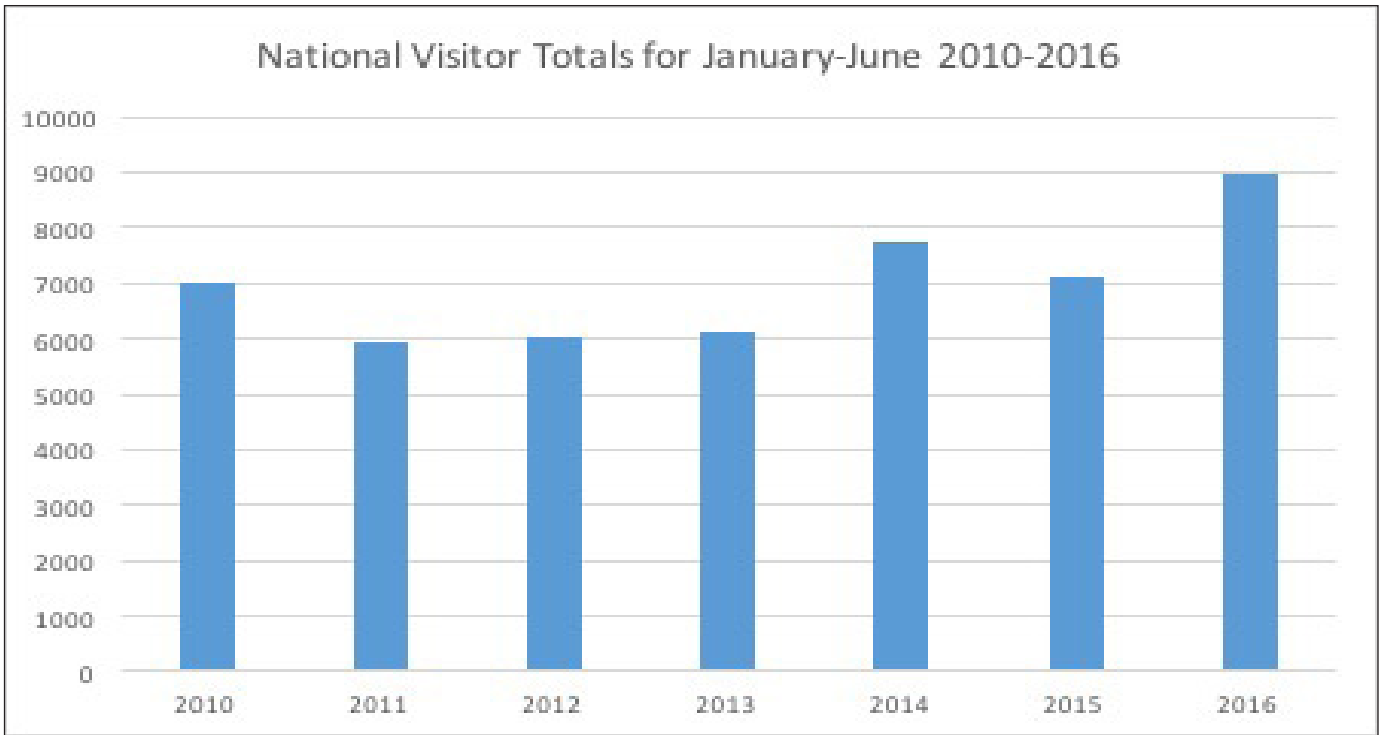


Figure 10. National visitor totals for January – June, 2010 - 2016 (data compiled by Katrina Gargett and Burcu Demir).

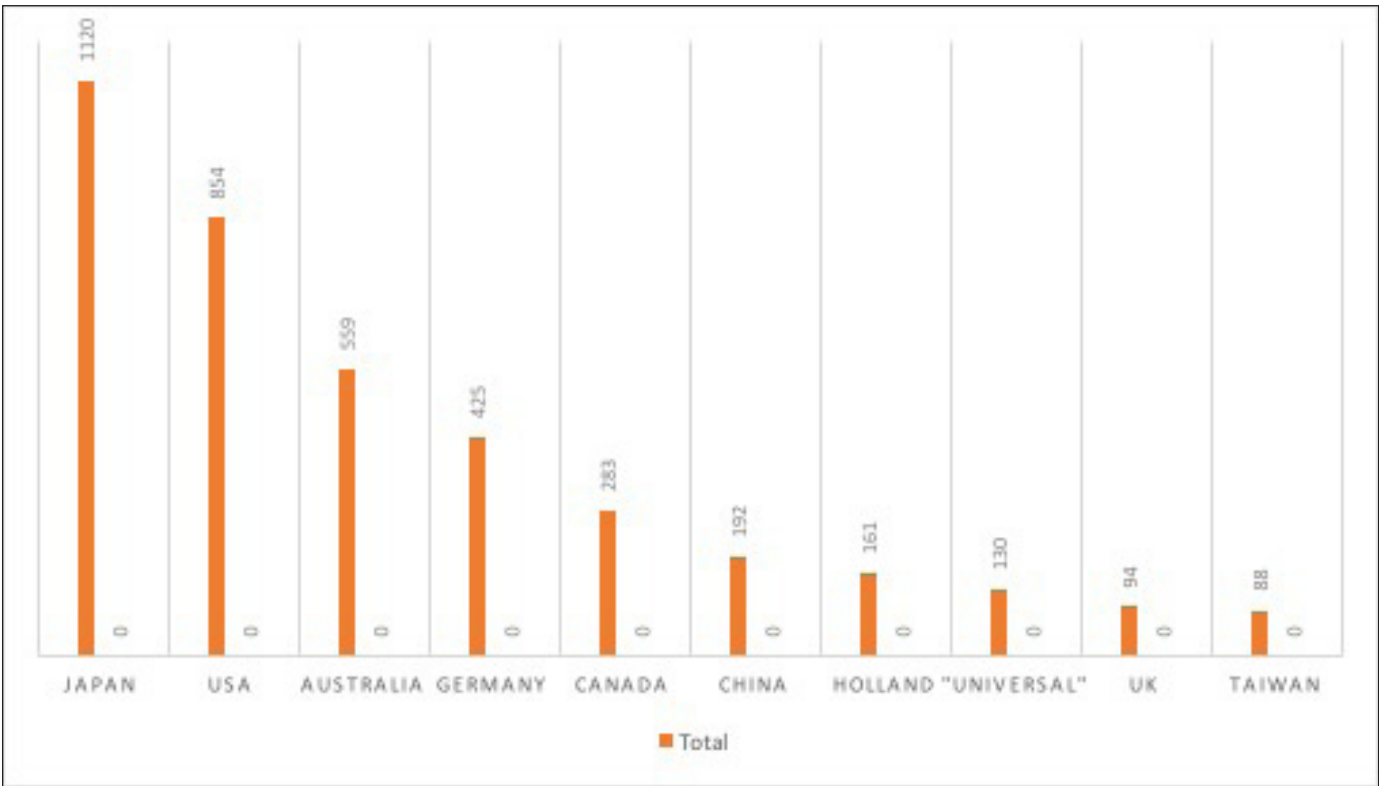


Figure 11. Top 10 nationalities in terms of visitor numbers for the 2015 calendar year (data compiled by Katrina Gargett and Burcu Demir).

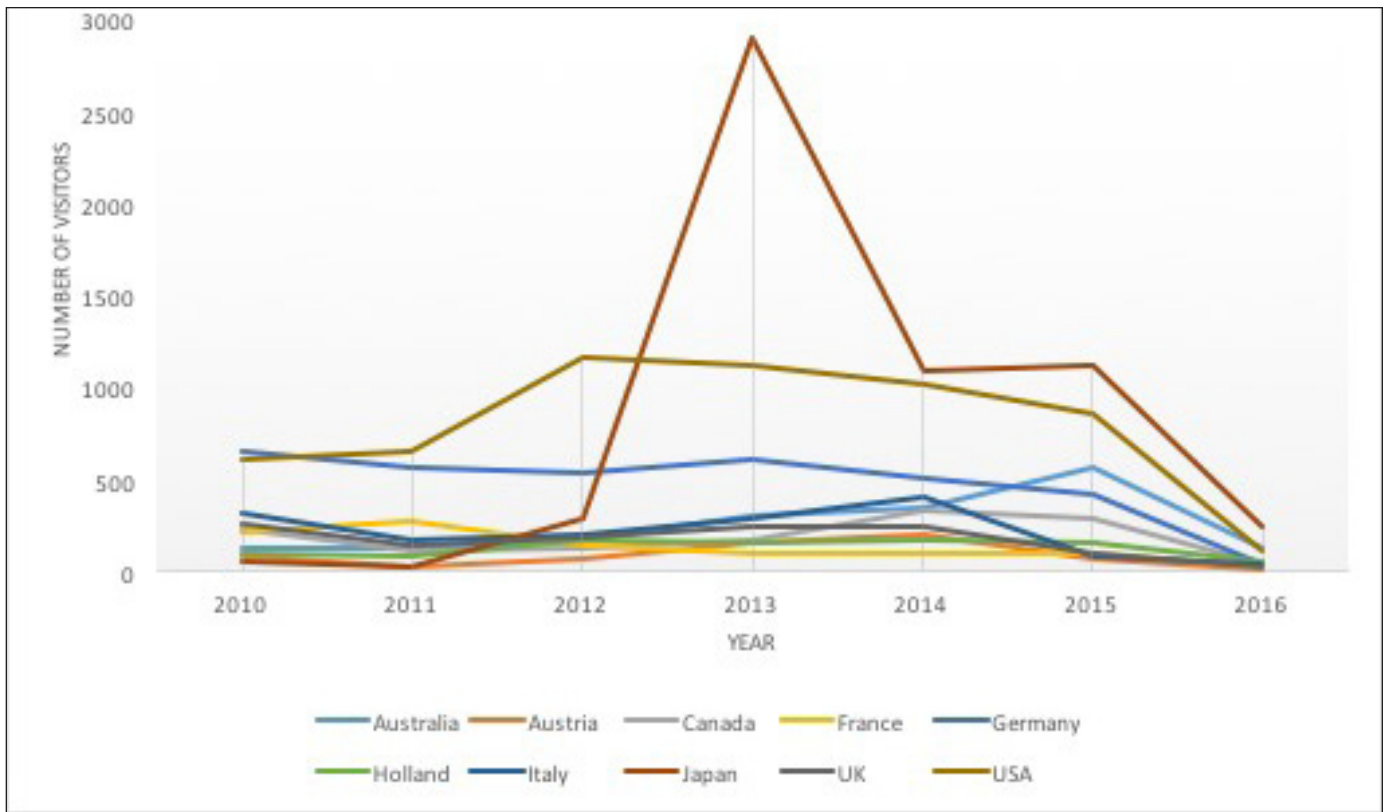


Figure 12. Top 10 nationalities in terms of visitor numbers from January 2010 to June 2016 (compiled by Katrina Gargett and Burcu Demir).

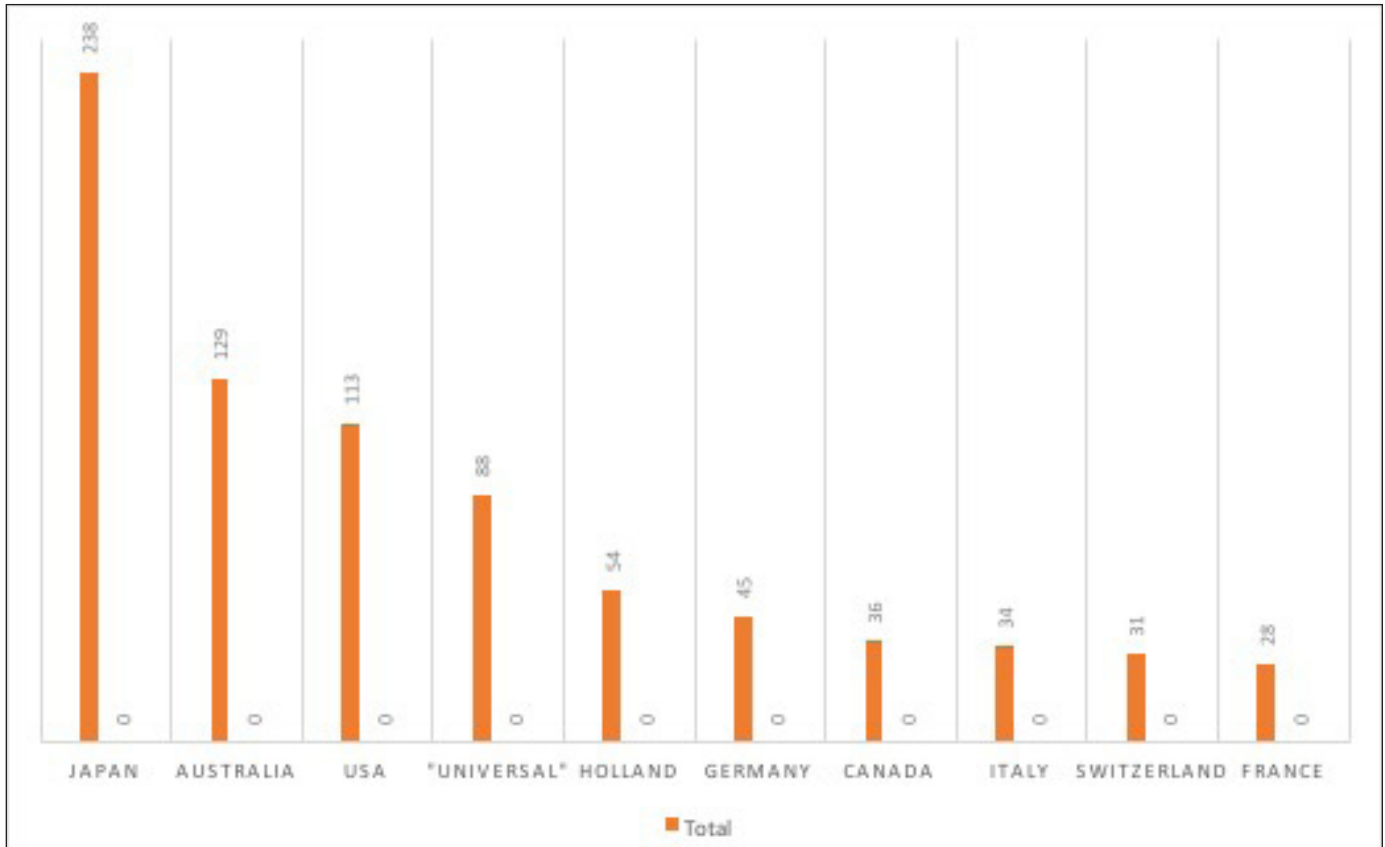


Figure 13. Top 10 nationalities in terms of total visitor numbers, January - June 2016 (compiled by Katrina Gargett and Burcu Demir).

Çatalhöyük visitor qualitative studies

As per every year, we are heavily invested in studying the visitor experience on site. To this end, we conduct visitor observations (this year with more than 100 visitors spread across six groups, representing both local, national and international tourists of all ages and backgrounds); visitor surveys (administered to over two dozen individuals over the past two years); informal visitor interviews (with a selection of visitors linked to our observational studies); and review of visitor comments in the site's guest book. The latter tend to reinforce our findings through interview, particularly visitors' interests in seeing archaeologists at work, their longstanding desire to travel to the site to see it first-hand, and, upon arrival, their feelings of deep connectedness in the present with the past:

"When I was 8-9 years old I saw Çatalhöyük on a magazine. Now I am 24 years old and I am here. Very amazing..." (anonymous visitor comment, 2015/16, translated from Turkish by Burcu Demir)

"This place is really fascinating. 9,000 years ago people called this place as their home. In our visits, we touch people who lived thousands of times. This is really amazing." (anonymous visitor comment, 2015/16, translated from Turkish by Burcu Demir)

"Çatalhöyük was an unforgettable experience in this beautiful spring day. Even people who don't have an interest in history wanted to be an archeologist after that." (anonymous visitor comment, 2015/16, translated from Turkish by Burcu Demir)

"The site took my breath away. When I breathed here, I was feeling different sensations. I think it is found absolutely. A great place!" (anonymous visitor comment, 2015/16, translated from Turkish by Burcu Demir)

Owing to our limited time on site this year, we have archived these data and are set to produce a detailed, multi-year analysis for academic publication sometime following the 2017 field season. This will complement – and perhaps fold into – Katrina Gargett's recent enquiries (via interview and survey) into the impacts of UNESCO status on the site's various constituencies, including community members, academics and visitors. Katrina aims to prepare her findings for publication over the next year.

Website, blog and social media

We have been heavily involved not only in developing Çatalhöyük's website (under the leadership of Dominik Lukas), but also in shaping and elaborating its social media presence (on Facebook, Twitter and through the catalhoyuk.com website). This season we worked with Dominik to make or suggest some minor edits to the website content that we developed together last year. Furthermore, we interviewed over 15 team members/team leads in order to develop materials for distribution via social media. These interviews and related research enabled us to publish 22 separate posts for circulation on both Facebook and Twitter, with a series of additional posts also now available in draft form and potentially deployable in the upcoming year (Fig. 14).

In addition, we authored a half-dozen blog posts. Combined with the articles we prepared in 2015, we now have 17 separate blog posts ready to be published on a monthly or bi-monthly basis until July 2017. The first two of these pieces (introducing the blog and the history of media work at Çatalhöyük, and the conservation team, respectively) have been circulated online already to good effect (Fig. 15).

Owing to our limited time on site, and given that the blog posts have only just been launched, we have chosen to postpone investment in a full analysis of the reach and engagement data associated with our online initiatives until next year. Jenna Tinning (in the 2015 Çatalhöyük Archive

Report) set an impressive precedent for review of our social media impact. In 2017, then, we aim to revisit the data and weave their analysis into a larger discussion of our digital engagement aims.

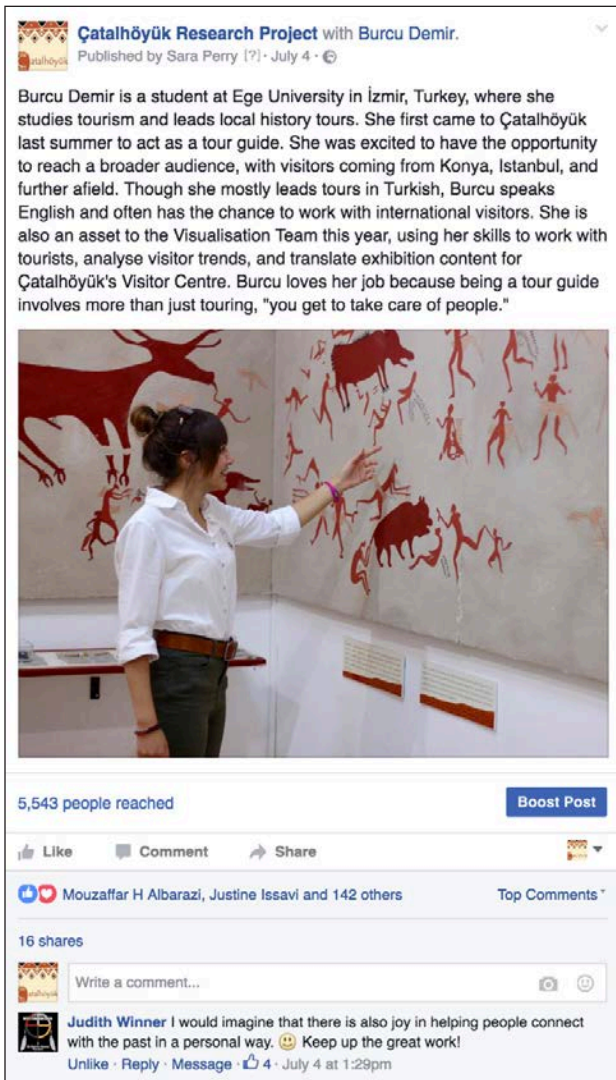


Figure 14. Screenshot of one of the two most successful (in terms of numbers of views, shares and engagement via commentary) of our social media posts in Summer 2016.



Figure 15. Screenshot of first Visualisation Team-authored blog post on catalhoyuk.com, published in August 2016.

Visitor's Centre: New welcome panel

Those familiar with the site know that the Visitor's Centre has, for several years now, had a small welcome sign affixed to the front of the desk. However recent renovations to the entranceway have made the sign virtually invisible and related information panels obsolete. The most recent review of visitors' engagements with the Centre have suggested that an explicit explanatory 'Welcome' panel would be meaningful. Accordingly, under the leadership of Katrina Gargett and Tara Copplestone, such a panel was conceived, with the aim of detailing for visitors Çatalhöyük's importance, as well as what they might expect on their tour of the site, and how to proceed around the Centre itself in advance of their journey outdoors (Fig. 16).



Figure 16. Rendering of Welcome Panel, with some minor edits to the text still pending (design by Ian Kirkpatrick).



Figure 17. Installation of the new Welcome Panel: a team effort!

Working collaboratively, Tara and Katrina settled on a basic design philosophy:

- Large size – consistent with the existing map / tour layout sign in the entryway
- Consistent header branding
- Consistent use of color palette with existing signage (burnt orange, black, orange, white)
- Plain line-base (as with existing large information panels)
- Text consistent with Turkish / English being in red-orange / black

- Image line-drawing style consistent with guide map at entry or exiting images used in guidebook with certain features such as trees in dark cut-out style
- Consistent font
- Add and create a 'Çatalhöyükian' design for social media icons

It was decided that the sign would be constructed to take up the entirety of the space in the foyer adjacent to the entranceway to the Visitor's Centre, creating a full focal point which would start visitors' tours. Subtle coloring was added to the sign to provide dynamism and graphical flow (Fig. 17).

The panel was affixed using a combination of wall-hooks (plastic eyelets, screwed into the wall using a concrete drill bit) which were rotated to lock the sign in, further secured with double-sided foam tape. The tape was used at the top, bottom, sides and diagonal of the panel to prevent it from protruding off the wall, holding it in position and reducing stress on the plastic eyelets.

The panel now occupies a previously-empty space, providing an at-a-glance introduction to the site. Indeed, it fills a gap in current interpretation, contextualizing the larger implications of the site and setting the scene for how the visitor's journey should unfold. To this end, whilst we were unable to test how visitors engaged with the panel, at first installation it seems to provide a much-needed bridge in the wider understanding and visualization of the site.

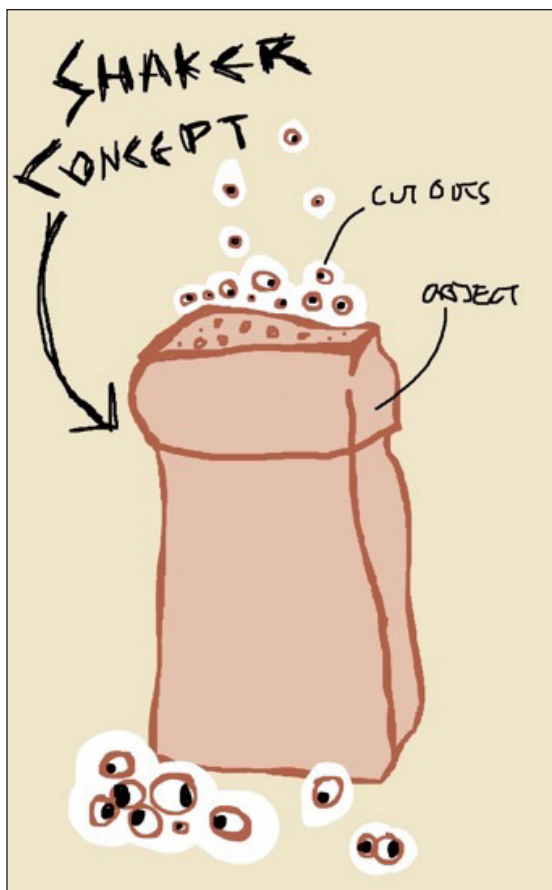


Figure 18. Concept for cardboard enhancement of replica of ancient shaker on display in the Visitor's Centre (design by Tara Copplestone).

Visitor's Centre: Bringing the replica artifacts into focus

The Visitor's Centre displays a handful of replica artifacts that were produced nearly two decades ago and then hemmed into niches (behind glass) on the western wall. They are never handled – let alone cleaned – and are positioned in an otherwise sterile setting. Indeed, the plain whitewashed walls around the artifacts and associated labels give only negligible information about their context of use or their importance. Unsurprisingly, visitor observations also suggest that dwell time is low in relation to these objects.

Under the leadership of Tara Copplestone, with major support from Ian Kirkpatrick and Burcu Demir, a complementary form of display was conceived in an effort to better put these replicas into focus. Using basic cardboard cut-outs, the aim was to help visitors envision the artifacts' use and significance without having to first read their labels. A related intent was to provide a point of interest within the otherwise white cases, thereby drawing the visitor in to learn more. In the future, it is anticipated that the existing information-cards in the cases could be updated to better fit with the style of the cut-outs and branding of the Visitor Centre.

- Inspired by a similar exhibition style in the Aarhus-based Moesgaard Museum, Tara settled on a basic design philosophy:

- » Plain cardboard drawn upon with pen/paint (ideally, however, this material would be plastic Perspex or translucent thin-plastic, rather than card)
- » Style consistent with line-drawing style used in other designs by Ian Kirkpatrick
- » Standard color pallet (burnt orange, black, peachy-yellow)
- » Use of iconography / design from the archaeological record (diamonds, zig-zag lines, dotted triangles)

The design process began by sketching out various ideas digitally, experimenting with how elements would fit within the niches and with the types of materials that would be needed to make effective displays (Fig. 18). From here, draft designs were produced using thin cardboard. At this stage a variety of different approaches were experimented with, including the possibility of physically painting a scene on the back of the alcove; printing bent Perspex jigsaw pieces to give depth; creating dioramas out of cardboard boxes and cardboard inlays; and, the simplest of the designs, using 2D cardboard illustrations affixed in line with the artifacts. After discussion and experimentation, it was decided that the cost and implementation time would be prohibitive, and as such prototypes would be made by hand out of plain card. These prototypes would subsequently be assessed for wear and tear over the next year and production methods updated accordingly. And visitor observations and interviews in relation to their engagement with the cards would be conducted in the future in order to determine whether to continue producing such displays.



Figure 19. Shaker card on display in situ in the Visitor's Centre.

It was decided, to keep focus on the artifact, that a two-tone design on the cards would be employed—in black and red. Additionally, their content would be sufficiently abstract as to avoid being prescriptive. The materials for production unfortunately did not arrive until the night of installation, leaving the team just a few hours to sketch, cut, draw and install the cards. In the end, two were executed in full. Although it had been the intention to install one per case, the two which are currently installed will serve as pilot studies for the coming year. Should they effectively hold up and garner visitor interest, further implementations can be created (Fig. 19).

Visitor's Centre: Excavation panels redesign

The Visitor's Centre currently features a series of three panels focused on the process of excavation, entitled 'What is excavation?', 'What happens to the finds?' and 'How do we date a site?'. Whilst these serve the basic purpose of explaining what excavation is, it was noted that much of the information presented is outdated and does not convey the importance of the way archaeology is practiced at Çatalhöyük. It was thus deemed necessary to replace these panels, including new information such as the uses of digital recording on site. Moreover, the aim was to also give greater attention to the specialist labs at Çatalhöyük in order to make visitors aware of unusual and innovative ways archaeology is practiced on site.

Under the leadership of Dena Tasse-Winter and Katrina Gargett, and complemented by interviews with specialists (conducted by various Visualisation Team members in the course of their preparation of their blog and other social media posts), a plan was conceived to consult lab teams about the information they wanted to convey to the public about their work. Dena and Katrina then collaborated to modify the content provided by lab teams to heighten its accessibility for our visiting audiences. New photos and imagery were also collected to show the process of excavation and new technologies employed on site.

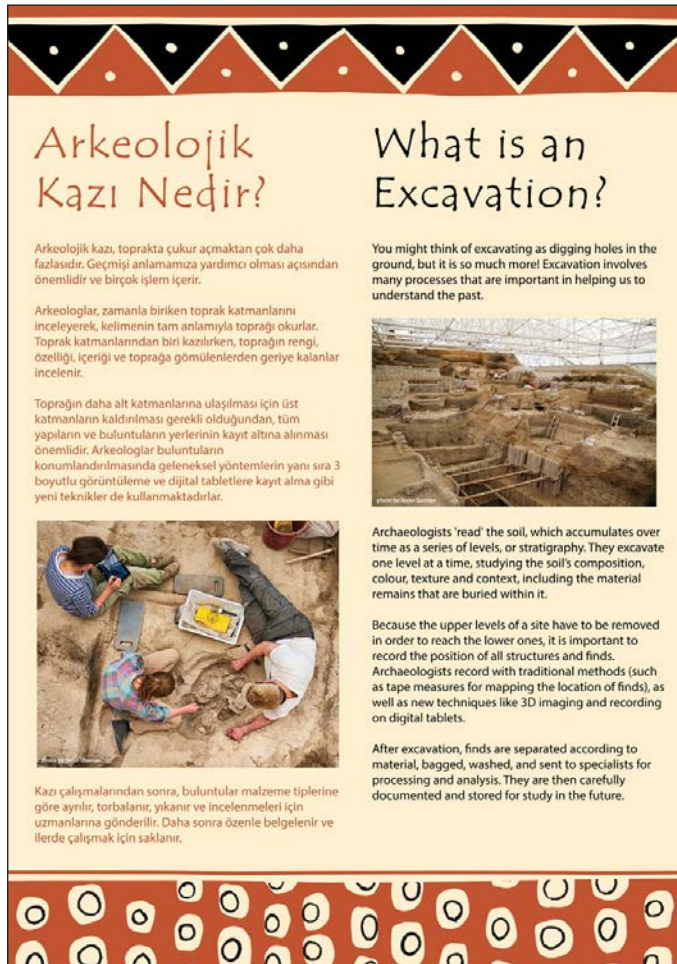


Figure 20. Rendering of first of two new excavation panels, with some minor edits to the text still pending (design by Ian Kirkpatrick).

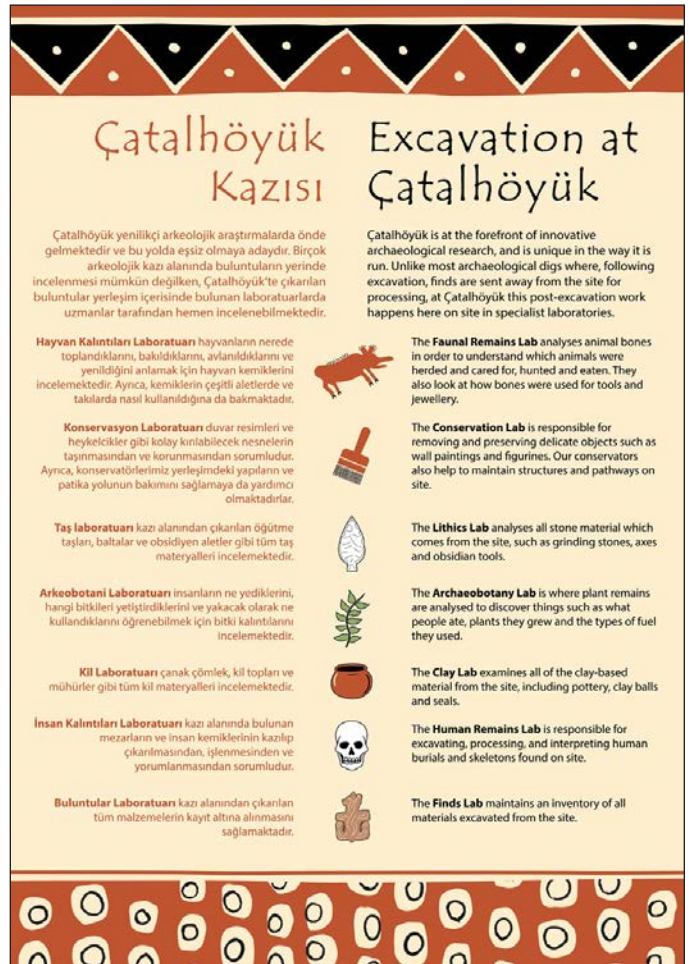


Figure 21. Rendering of second of two new excavation panels, with some minor edits to the text still pending (design by Ian Kirkpatrick).

Two panels have now been produced in the same style and material as existing signage (Figs. 20 and 21). Whilst the original excavation signs were positioned on the southern wall of the Visitor's Centre, a decision has been made (based on visitor feedback and overall narrative coherence) to reformulate the trail around the Centre, moving discussion of present-day activities on site (e.g. excavation and lab practice) to the end of the tour in order to foreground Çatalhöyük's past. As such, the new panels have been installed on the northern wall adjacent to a new Experimental House panel (see description below). Existing signage on the Northern wall (related to topics of landscape and environment, trade and craft and burial) has now been relocated to the southern wall. Plus, one existing panel on 'local involvement at Çatalhöyük' has been entirely removed owing to its outdated nature.

Provision of an on-site family trail

There is currently no interpretation at Çatalhöyük aimed specifically at younger audiences. This represents a significant gap in the site's offering to visitors. Under the leadership of Izzy Bartley and Dena Tasse-Winter, then, a plan was devised to produce a series of on-site panels designed for this younger demographic.

In conversation with the team, Izzy and Dena decided to design the trail panels to facilitate more experiential engagement with the site – directing younger visitors to actively look at the archaeological record, to imagine scenarios and to try and picture life at Çatalhöyük in the Neolithic. A related aim (given the ever-changing nature of the excavation) was to create panels whose subject matter was flexible enough to allow the signage to be easily transplanted from one area of the site to another. In other words, if the panels were moved, the intent was that such moving should not have a substantial effect on the experience. To craft meaningful panels that are still sufficiently generic to enable relocation is complex; hence Dena and Izzy focused on features they felt would always be visible, e.g. excavated burials, brick walls (Fig. 22). In addition, the exclamation 'Wow!' was used on the panels to introduce concepts of potential surprise to visitors (Fig. 23): e.g. burials beneath floors; homes occupied by those not in standard kinship groups. The aim was to encourage interest and constructive forms of reflection/enquiry about the subject matter among visitors.



Figure 22. Rendering of a new panel for our family trail, focusing on visible features in the excavation areas (design by Ian Kirkpatrick).



Figure 23. Rendering of a new 'Wow' panel for our family trail (design by Ian Kirkpatrick).

The panels were designed to appeal specifically to younger visitors, drawing upon a unique aesthetic that distinguishes them from existing signage. That aesthetic entails a new color (teal) for the panel borders and a new panel shape (square). For the graphics, existing colors and design approaches were used to ensure an overall fit with existing interpretation. Izzy and Dena chose to use a character as a ‘guide’ to help focus young visitors—giving them a figure to keep on the lookout for. Owing to a desire to be gender neutral, an animal character (horse) was derived from a representation visible in the replica wall painting in the Visitor’s Centre. Plexi was chosen as a substrate as it is more tactile than, for instance, metal; and 5mm holes were drilled for fixings as necessary.

The panels were printed with two layers of ink directly to the Plexi. (Testing of one-layer print led to a poor quality finish.) In the past, the print company, Renk, affixed printed stickers to the back of Plexi sheets, leading to an exceptional quality finish for signage. Unfortunately, this option was no longer available, hence our decision to settle with a two-layer ink Plexi print.

Printed panels were then installed on site in various locations necessitating slightly different fixings (e.g. Figs. 24 and 25):

- Fixed to Visitor’s Centre wall: Double-sided foam tape.
- Fixed to Experimental House: Long nails.
- Fixed to railings: Screwed to wooden board, metal plumbing fixings attached to board and round railing.
- Fixed to wooden strut of North Shelter: Screwed to wooden board, metal fixings attached to board and round strut.
- Fixed to fence uprights: Screwed into uprights.

Both English and Turkish texts were written specifically with children in mind and the English version scores 80.7 on the Flesch reading ease scale, correlating to UK Year 5 or American grade level 4.3.



Figure 24. Ian and Izzy finish the installation of a new family trail panel at the entrance to the North Area.



Figure 25. Ian, Katrina and Izzy install a ‘Wow’ panel – part of our new family trail – at the exit to the North Area.

Provision of a downloadable digital brochure to accompany on-site family trail

In terms of take-home provisions for visitors, our team has (1) had difficulty maintaining sufficient copies of touristic materials on site, and (2) suffered from various negative fallouts associated with hand-outs for visitors (e.g. our brochures tended to be quickly discarded after receipt, often tossed on to the site itself in the course of visitor tours!). However, to accompany the family trail (described above), Izzy and Dena wanted to produce a resource that, firstly, could be downloaded and used at home, and secondly, could supplement the existing panels on site. Visitors might then deploy the resource at home – should they be unable to tour the physical site – or print it ahead of time and use it to add further detail to the trail.

Moreover, due to the variety of complications inherent in providing on-site interpretation (for example, signs being moved / broken / removed) it was decided that a more complete home-printable trail, including activities for visitors, would be meaningful and perhaps longer lasting. Moreover, it could be hosted on www.catalhoyuk.com and downloaded prior to visitors' or tour guides' arrival.

A basic concept for such a downloadable A4-sized trail brochure has been devised by Dena and Izzy, for completion during a future field season. In its current form, the brochure will include some or all of the on-site panel content (enabling visitors to understand the panels should any be removed), as well as activities aimed at encouraging enjoyment and use of imagination among visitors.

Video-game intervention

Çatalhöyük has increasingly become entwined with digital media implementations and interventions. These digital media can be observed in most phases of the archaeological process: from the use of tablet PCs for recording archaeology at the edge of the trowel, through to leveraging the centralized database and geo-database in post-processing. Conspicuously absent, however, are digital visualizations or narratives to be used on-site by visitors, although prototyping work on this front has been ongoing since 2014 (see Roussou *et al.* 2016; Katifori *et al.* 2015). In part, this issue has historically been related to the cost, time and accessibility issues associated with developing digital-media interventions on site in the space of two weeks – the timeframe which the Visualisation Team typical has to execute their craft. This year the team has a strong digital literacy component and, as such, it was decided that a low-impact prototype might be created. Such an intervention had to be easy to make, on no budget, with few maintenance requirements and produced with the tools which were on hand to the team.

Led by Tara Copplestone and Izzy Bartley, a prototype was conceived, aiming to fill the following gaps in how the site is currently visualized and accessed by visitors:

Permanency of signage: Currently, the signage around the site is non-permanent and as such can be moved. Likewise, there are certain external areas of the site – for example, the old river bed – where signage cannot be affixed due to the extremity of the elements and the inability to permanently dig signs into the ground. Creating explicit signage, which refers to specific elements of the excavations or past is thus difficult. To this end, a digital intervention which is geo-located or otherwise geo-oriented could provide explicit context in areas that otherwise are hard to discuss, thereby providing much needed contextual information in a way which does not physically impact the site.

Overarching narratives: Much of the signage on site provides clear narratives within their own contexts – for example, within the Experimental House the narrative has an obvious flow and rhythm. However, once that discrete area is left the narrative is likewise left, replaced by another discrete narrative. To this end, there is the potential to implement an overarching narrative which draws these existing tracks together and provides a context through which they can interpolate.

Entwining past and present narratives: Çatalhöyük is a unique site with regards to how the narratives of the Neolithic past and archaeological present entwine. Currently, there is significant signage which explores one or the other of these tracks – discussing the practice and craft of archaeologists as they excavate, the finds themselves or the reconstructions of the past. What needs development (building upon the work of Roussou *et al.* 2016; Katifori *et al.* 2015), however, is a narrative which explicitly ties these elements together, showing the relationship between the past and present and how this relationship impacts how we understand and explore the past and our relative position to it. To this end, it was identified that there was the potential to implement a digital narrative which used particular affordances of the digital medium – such as agency and multivocality – to explore this relationship explicitly.

Taking these identified areas into account, it was decided that the video-game media form would best suit these purposes. The design specification initially identified that the age group between teenagers and mid-40s would be best suited for a low-impact digital intervention, and as such our draft plans aimed to target this group. Due to the shortness of time on site it was decided that the intervention would be created using the Twine engine (a game platform which focusses on creating multilinear narratives) and that the focus would be on creating a reflexive and multilinear narrative in which the player was afforded agency in progressing or forming the text itself.

The design and development of the game went through two major restructurings and a minor restructuring:

Geolocated game: The initial draft of the game was conceived as using geolocation technology to unlock context-specific content. For example, whilst in the North Area, the player would be able to move around and unlock specific material relating to the excavations there, whilst in the Experimental House, the South Area, or near the spoil heaps, the player would likewise be able to unlock content which made sense to those areas. This would also enable the overall environmental context to become an integral part of the interpretation. The structure of this game was such that the player would follow a “guide” who would provide context between the past and present, and based on how the player was moving around the site would be able to make comments regarding what they were seeing and doing. However, after much trialing, this was deemed unfeasible due to a number of reasons. Firstly, the internet signal on site is not steady, causing the game to drop in and out and leading to it crashing. Secondly, due to the current global political situation, the accuracy of the geolocation is only to within 160 meters, negating the use of this technology.

A significant amount of coding was undertaken in an attempt to work around these problems. However in the end it was decided that the only realistic way to produce a workable game under current conditions was to stick to a non-geolocated version. In the future, it would perhaps be worthwhile to pick up this design again – perhaps using iBeacons rather than GPS - so that the site itself hosts the geolocated areas and as such the precision is guaranteed.

Geocontextual narrative game: The second design did away with geolocation and instead included geocontextual narratives. By this, it is meant that the game prompted the player to identify where they were on the site and would serve back information that was relevant to that area. The evident

downside to this kind of structure is that it relies on the player firstly being on site and secondly, their correct identification of their surroundings. Initially, the design for this intervention was based around humorously unpicking the relationship between the past and present, using a guide from the Neolithic who provided commentary on both the site in the past, and the present archaeological work. This idea was subsequently refined to better and more seamlessly articulate this juxtaposition.

Refined geocontextual narrative game: The updated version of the game moved more towards a poetic interpretation, using the juxtapositions of the site as the basis for driving the various narrative tracks. For example, the life and death of houses is leveraged as cyclical and from here the relationship of archaeologists to the record is examined. The affordances of the video-game media form become central to how this can progress – using a macro script which juxtaposes text elements against each other in a cycle to make the narrative themes part of the mechanical structure of the game. Within this structure, we updated the way in which the game could be navigated, adding an additional mode where you can play entirely from home. This mode was meant to use the same game-system, but remove the directive language within it so that it made sense to audiences playing externally. This was the version of the game which we decided to proceed with (Fig. 26).

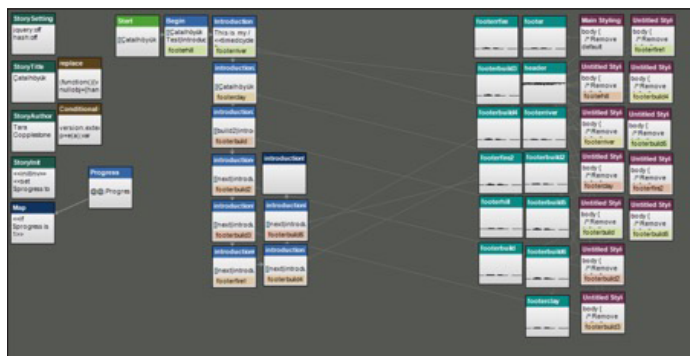


Figure 26. Screenshot of the basic structure of the game in the Twine engine. Two key scripts form the basis of the design, with conditional CSS elements being used to pull additional image designs in as necessary (image compiled by Tara Copplesstone and Izzy Bartley).

Tara and Izzy settled on eight main topics centering around life at Çatalhöyük:

- Home (including the cyclical nature of house building and destruction)
- Family
- Romance / Relationships
- Play
- The environment
- Trade and travel
- Aesthetic
- Death and burial

Through the narrative content of the game the following themes were explored:

- Entanglement / Entwining of past / present
- Juxtaposition
- Cyclical events
- Agency

Elements of game mechanics within the Twine include:

- Reflexivity
- Multivocality / Multilinearity
- Senses outside of the purely visual

A selection of the draft content is printed below with colored text indicating linking passages, and bracketed areas indicating implementation of one of the mechanics acting on the text to structure it in a particular way.

Geocontextual text

I want to [\[\[see\]\]](#) [\[\[smell\]\]](#) [\[\[hear\]\]](#) [\[\[taste\]\]](#) [\[\[touch\]\]](#) [\[\[feel\]\]](#) your experience of this place. Tell me something that you can [\[\[see\]\]](#) [\[\[smell\]\]](#) [\[\[hear\]\]](#) [\[\[taste\]\]](#) [\[\[touch\]\]](#) [\[\[feel\]\]](#) now.

*outgoing structures: for each thing a series of key-words and contexts are generated that create outgoing links that relate to the geocontextual area, for example: I can [\[\[see\]\]](#) [\[\[a winding track leading to a stark white building\]\]](#). [\[\[An experimental house, used to test theories of the past\]\]](#).

Home

I have spent [\[\[a long time\]\]](#) [\[\[10,000 years\]\]](#) [\[\[a lifetime\]\]](#) watching this place.

This place was my [\[\[house\]\]](#) [\[\[home\]\]](#)... I [\[\[lived\]\]](#) [\[\[died\]\]](#) here... other years were spent in different homes...[the whole town was my home](#).

Home

I hear the archaeologists talk about home. One [\[\[structure\]\]](#) [\[\[place\]\]](#) [\[\[family\]\]](#). I

House.

The houses here [\[\[are born\]\]](#) [\[\[live\]\]](#) [\[\[die\]\]](#), just like the people. They change over time, old paintings plastered over, the new surface painted...a repetition of actions through time... each one a little different.

born, live and die

Our homes are [\[\[shelter\]\]](#)...[\[\[storage\]\]](#)...[\[\[sanctuary\]\]](#)... [\[\[life\]\]](#) [\[\[death\]\]](#). Fires engulf and destroy, walls are crumbled and the new rises out of the old, a little higher, but much the same.

Family

I sleep above the dead. Some of them my [\[\[blood-kin\]\]](#), others tied by more [\[\[elusive bonds\]\]](#).

elusive bonds

I listen to the archaeologists debate the people from my time... [\[\[our ways\]\]](#)...[\[\[our relationships\]\]](#). Our relationships seem different to those in your time...

They don't understand our ties...

They uncover many things...[\[\[objects\]\]](#)...[\[\[paintings\]\]](#)[\[\[structures\]\]](#)...[\[\[the bones of my ancestors\]\]](#)...they weave their stories... [but they may never really know](#).

but they will never really know

they can imagine what it felt to live here...how we loved and lost...[how we danced and played](#). The ground will never surrender all our secrets... the physical is only one portal to our past.

the bones of my ancestors

They find our [bones entwined with others](#)...male, female, young and old. Our town, spreading upwards and outwards but my people, [\[\[connected\]\]](#) [\[\[disconnected\]\]](#).

Romance / Play

[how we danced and played](#).

Our [\[\[footprints as we danced\]\]](#)[\[\[laughter as we played\]\]](#)[\[\[sorrow as we lost\]\]](#) are lost to time.

Dreams

I grew up here, my hopes and dreams developing as I did so. The archaeologists turn their scientific instruments on our bones, but they can never find the trace of that **embrace**.

embrace

I am a person, we were a people. We have left traces of our **lives**. But much of our **deaths** are intangible. What do you know of our **lives**?

Lives

You look back at us through your own time, with your own **ideas**.

Aesthetic

ideas

My people lived together in a **egalitarian** society. But archaeologists still find our **tools**.

Tools

I made beautiful things, sometimes from bone, sometimes from **stone**. The archaeologists find them and marvel at my skill. It is strange to see these things again and remember...

stone.

Oh the figurines! They cause a stir whenever they are found. I watch the excitement flood through the site. I hear the word 'Goddess' repeated over and over. I could whisper it all to them, tell them exactly what these things were... but there are some things **that should be left unknown**...

Death and Burial

bones entwined with others...

The archaeologists struggle to understand our ways... the meanings behind how we buried and re-buried our people. The bones of our ancestors were not left **undisturbed then**, just as they **are not now**...

[[remainder of text to be written in the future]]

Tara and Izzy settled on a basic design philosophy:

- Patterns drawn from existing branding
- Black and white simplistic design for the basis
- Textual elements in grey, with actionable text (things that can be interacted with) appearing in red and orange
- As each frame progresses in the story, the background elements will update – adding in features such as the river, houses being built and destroyed, the vultures, etc.
- Game can scale to be played on any device

Whilst in the field, Izzy and Tara managed to get the basic framework implemented – the interactive text, overlaying elements, updating graphic interfaces and additional basis for multilinearity (Fig. 27). Further to this, they were able to implement the first strands of the narrative – writing approximately 2,000 words towards the branching story. Unfortunately, as time was tight, they were unable to fully realize the scope of the project. As such, development will continue on an on-going basis until the first fully realized prototype can be implemented, critiqued and deployed for testing. It is hoped that the successes and numerous challenges of this prototype project can pro-

vide a baseline that might be useful in informing how future digital projects can be planned and executed on site.

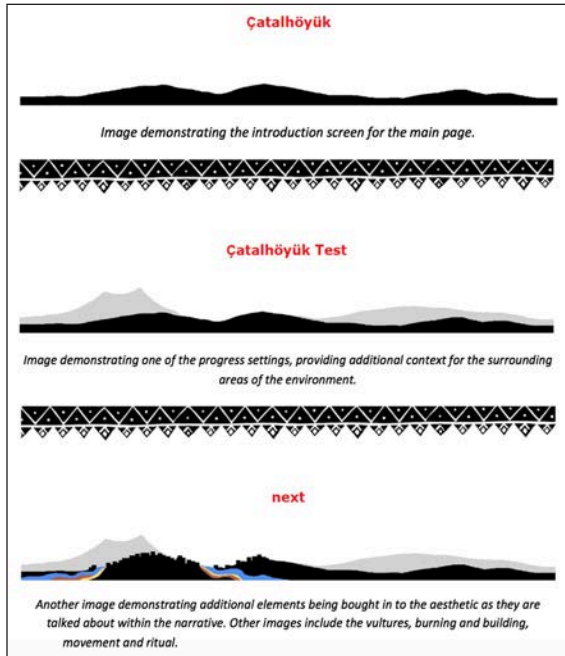


Figure 27. Screenshots of segments of the prototype game's graphic narrative (game developed by Tara Coplestone and Izzy Bartley).

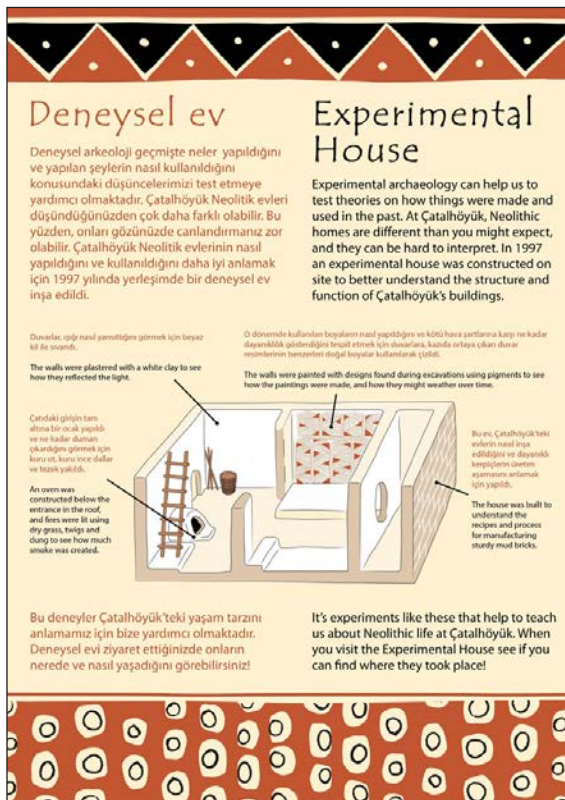


Figure 28. Rendering of a new panel for the Visitor's Centre intended to help visitors differentiate between the purpose of the Experimental House and the forthcoming replica houses (design by Ian Kirkpatrick).

The process of designing and developing this first prototype began to probe the way in which digital-media, especially those hosted through video-game formats, can provide novel engagements with the past. Çatalhöyük as a site is particularly well suited to these interventions, and using the Twine engine to think about the past provided avenues through which we were able to formalize many of the recursive, cyclical and multi-linear aspects of the site through media forms which inherently supported them. To this end, the development process behind this game, whilst incomplete and filled with set-backs, provided an interesting space to think about the archaeological record itself.

Updates to the experimental house

Under the leadership of Katrina Gargett and Tara Coplestone, a series of new printed materials has been produced for the Experimental House: two panels installed in the House itself, and one in the Visitor's Centre. In specific, a new sign has been designed for the Experimental House which incorporates the house's existing wall-paintings into its design. Beyond this, a replacement for one panel (which had seemingly been lost) was printed for reinstallation in the Experimental House's storage bin (exhibited at the left upon entering the home). And a new introductory panel for the House has been developed and hung in the Visitor's Centre. The latter is meant simply to provide orientation to the intent of the House, foreshadowing the construction of the replica houses whose purpose is distinctly different from the existing house (i.e. the latter is an experimental space, whereas the former are specifically intended as interpretative spaces for visitors) (Fig. 28).

In the Experimental House itself, the new installation was originally drafted during the 2015 field season in concert with the full revamping of the home's interpretative experience visitors. That original sign aimed to encourage visitors to 'extend' the wall painting themselves by drawing on a chalk board.

Unfortunately, the sign was never installed due to difficulties in sourcing a chalk board. Hence the content was rewritten using the same form and tone of text as our 2015 installations. The sign has been designed to fit

with the current experiential narrative in the house, which aims to get visitors moving around the space, exploring with their eyes, if not their full bodies. The new sign mentions the scope of artwork available on-site before directing the visitor to look behind them at the geometric patterning and burial area, in so doing continuing the narrative and linking together the house's various parts. The intent was always to install it under the current volcano/leopard print painting on the right side of the house towards the grain store (Fig. 29).

Working collaboratively, Tara and Katrina settled on a basic design philosophy:

- Follow the existing style in the experimental house
- Update the original image to show a figure using ochre and drawing geometric designs
- Affix to the wall using the chain method seen elsewhere
- Size it in line with the existing smaller boards within the house (i.e. the ladder sign)

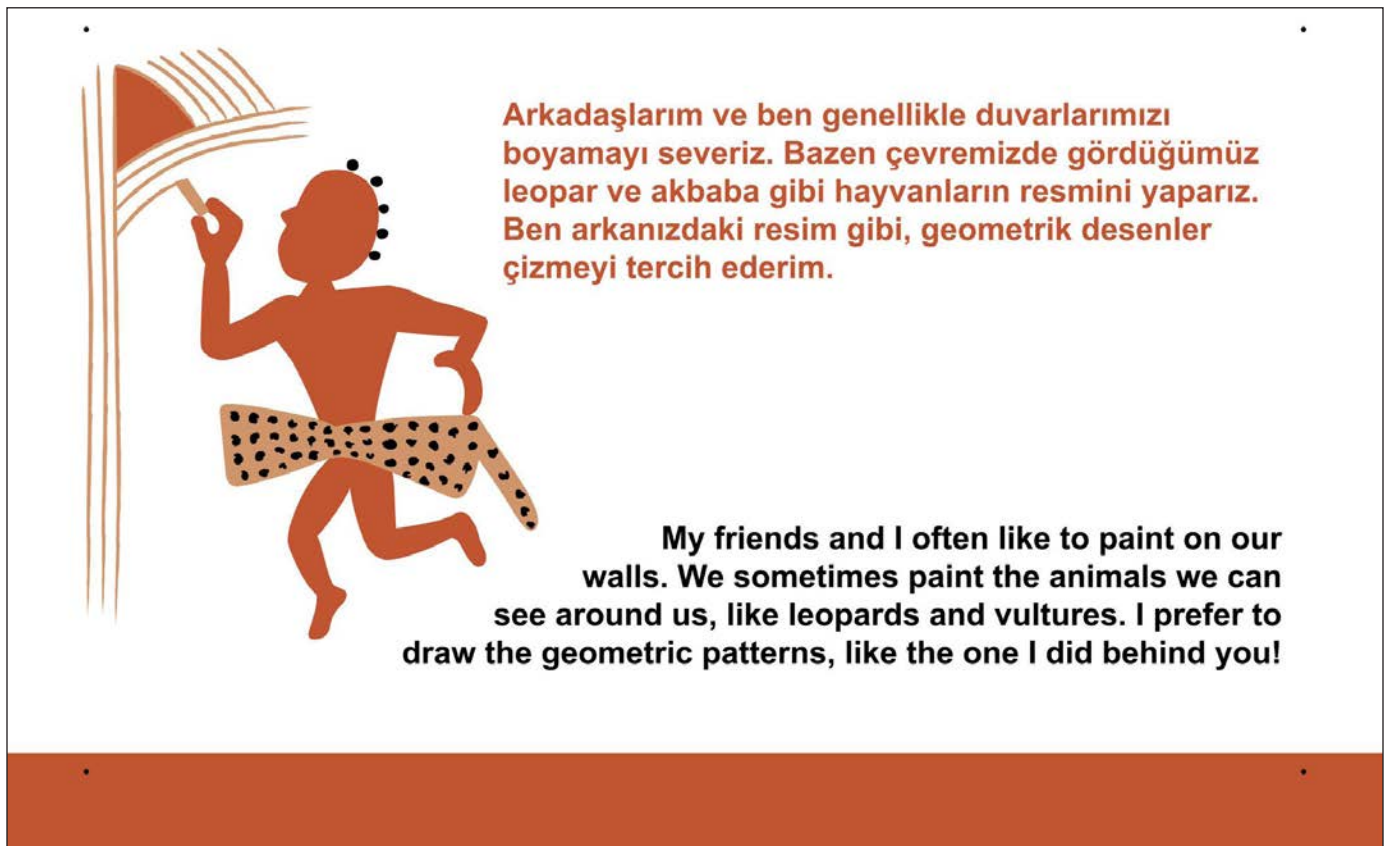


Figure 29. Final design of new sign for installation in the Experimental House (design by Ian Kirkpatrick).

Ultimately, the sign was produced to the same scale and image quality as those already existing within the experimental house. It was affixed using long nails well above the existing volcano painting, as it was feared that if it was placed lower it would not be immediately visible, or if it was placed on the floor that the Perspex would be scratched significantly. It is now highly visible, yet does not disrupt the visual flow within the house. At the time of our team's departure, the installation appeared secure: having chosen to use long-nails and with the position being out of direct sunlight, the sign is meant to be long-wearing. No significant issues were encountered in the design, development or installation process.

Visitor interpretative route through new replica houses

Long in their conceptualization and planning, four new abutting replica houses for visitors (adjacent to the Experimental House and the Visitor's Centre) are now in the early phases of construction. Labor involved in the original design, surveying, materials sourcing, and physical building of the houses has been invested by a variety of other Çatalhöyük team members and affiliates. Our team has worked in conjunction with them to begin formalizing a plan for the visitor experience, linking it to both the narrative in the Visitor's Centre, as well as to the Experimental House and the on-site tour. Last year it was decided, in conversation with Katy Killackey, Ashley Lingle, Marek Baranski, and Ian Hodder, to focus the interpretation on larger conceptual themes that are critical to an understanding of Çatalhöyük's past, but are complex to convey to visitors (without tangible remains to enable visualization of the subject). These themes are hence underexplored (or completely unattended to) in the existing visitor narrative.

The principle focus, then, of the replica houses will be the cycle of construction, occupation, dismantling and reconstruction of Çatalhöyük's buildings. The intent is for visitors to be introduced to the buildings – and the larger narrative of their life-cycle – at the close of their tour of the Visitor's Centre. From there, they will exit the center and be guided by a 'footprint'-style pathway to the entrance of the first replica house, then weaving in and out of each of the four buildings before carrying on their tour via the Experimental House and onto the site itself (Fig. 30).

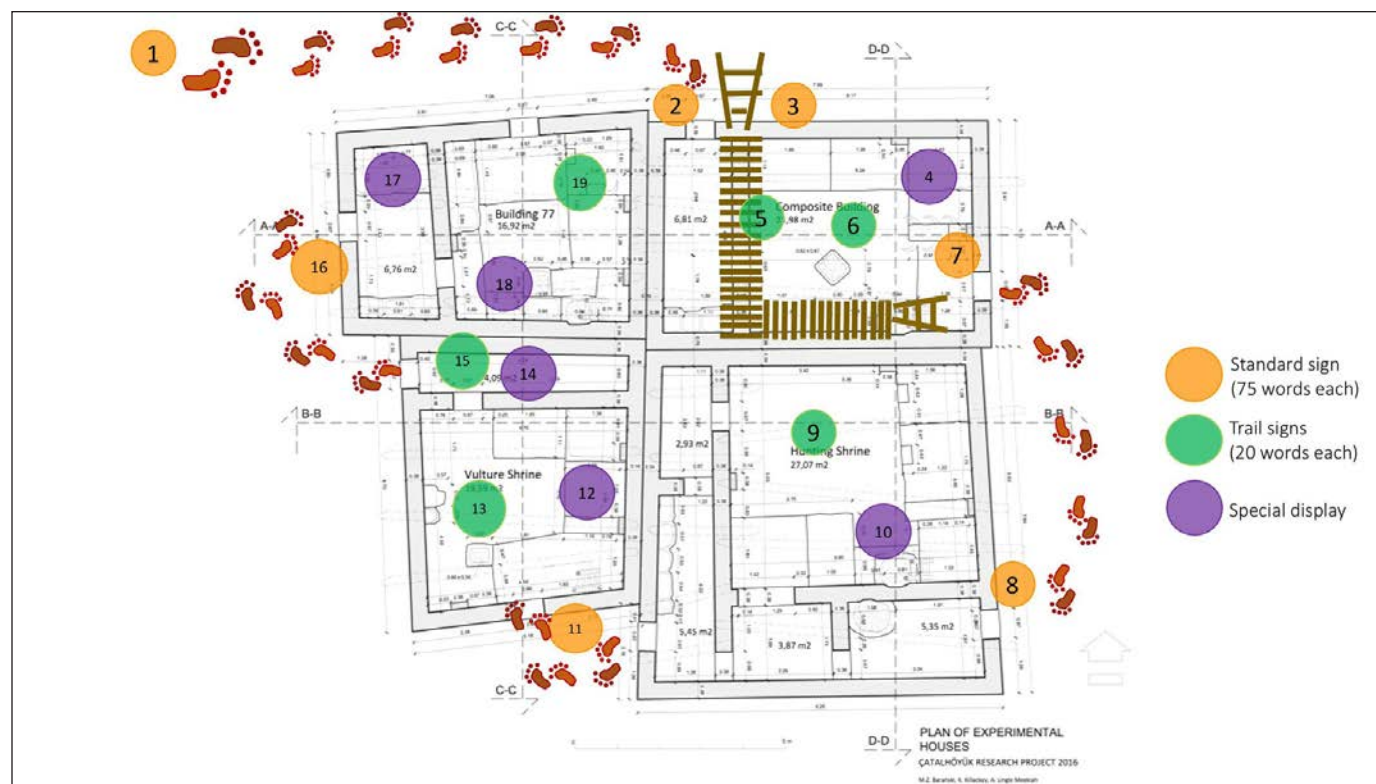


Figure 30. Mock-up plan of the visitor trail (including different styles of signage and interpretation) through Çatalhöyük's four new replica buildings (plan by Marek Baranski and Katy Killackey, interpretative designs by Sara Perry).

Visitors will be able to engage with the outside walls and inside spaces of all four replicas, as well as climb and walk atop the roof of the first of the four buildings (known as the 'composite' building). In the latter case, visitors will have the option of climbing a ladder to the rooftop, and then following a set route (running along/next to the west and south walls of the building) lined with wooden panels and fenced in via plexi walls, before then descending by ladder through the

rooftop entryway in the south-east corner of the house. As described below, visitors will encounter various installations in these locations (both inside the buildings and on top of the composite building), as well as longer explanatory signage (c.75 words each), and very short 'trail signs' (c.20 words) to peak interest around certain themes and facilitate forms of enquiry and interaction with the archaeological record.

While the exact nature of these various installations and signs is still somewhat negotiable, we have devised a preliminary plan for the visitor experience as follows, beginning in the Visitor's Centre:

Visitor's Centre

1. *Sign* (75 words) for Visitor's Centre (to be installed, ideally, on curtain next to experimental house sign) that introduces visitors to the replica houses and their construction

Footprints

- ** Stone or concrete slabs that demarcate the route out of the Visitor's Centre and through each house

Composite house (outside)

2. *Sign* at door to Composite House: If you are unable to climb this building and descend into it through the hole in the roof (as the people of Çatalhöyük used to do), please use this special door we've made here.
3. *Sign* at ladder entrance to Composite House: The roofs of homes were exciting places at Çatalhöyük. Not only did people cook, work and socialize on them, but the entrance to the buildings was up here too. Climb the ladder to find the front door and get into the house!

Composite house (roof)

4. *Rooftop display*: reconstructed hearth, covered area and activity area suggesting busy-ness on top of the building
5. *Trail signs* x 2 or 3 (20 words each) orienting visitors to life on the roof – oven/prep areas/door

Composite house (inside)

6. *Trail signs* x 4 to 6 (20 words each) on symbolism and social order at Çatalhöyük (symbols used to connect people/buildings, linked to important animals, etc. – can use text from Yapi Kredi/EAA Istanbul exhibition)
 7. *Sign* (75 words) at exit of Composite House: General orientation to the composite house itself, and instructions on where to go next upon exit.
- + *Display* inside house to have installations as per plan, including (i) bucranium in section to enable visitors to see the skull inside the plaster/paint; (ii) platform in section to enable visitors to see layers of plaster that compose the platform; (iii) pillar in section to enable visitors to see wood at the core of the plaster enveloping it

Hunting shrine (outside)

8. *Sign* (75 words) next to entrance: intro to Hunting Shrine (including excavation history, importance for revealing lifeways)

Hunting shrine (inside)

9. *Trail signs* x 6 to 8 (20 words each) on living, eating, lifecycle at Çatalhöyük (wall paintings connect to landscape and wildlife, storage areas to food and life indoors; including one or two signs in storage areas)
10. *Cooking display*: concerned with food preparation, including clay balls and 'spatulas' (scapula fashioned into tool)

Vulture shrine (outside)

11. *Sign* (75 words) next to entrance: intro to Vulture Shrine (including excavation history, importance for revealing death-related activities)

Vulture shrine (inside, main room)

12. *Buried body displays*: perspex prints showing burials, affixed at bottom of pit in platform; one of the three platforms might have skeleton graphic, one printed text on the perspex referring to exchange of body parts, one graphic of plastered or linen-covered or jewelry covered body)
13. *Trail signs* x 3 to 4 (20 words each) on sleeping/rest area, interment, vultures in skeleton preparation, connections between people maintained through these activities across space and time

Vulture shrine (inside, storage area)

14. *Storage display*: packed area full of goods stored for home and life at Çatalhöyük and/or equipment for destroying the home (in prep for the displays in Building 77)
15. *Trail sign* x 1 (20 words) encouraging visitors to take note of storage area

Building 77 (outside)

16. *Sign* (75 words) next to entrance: intro to Building 77 (including excavation history, importance for revealing rejuvenation/rebuilding-related activities)

Building 77 (inside – storage room)

17. *Fire/soot stain display*: intended to suggest burning of building in association with its destruction, carries on in parts in the main room

Building 77 (inside – main room)

18. *Rubble display*: intended to suggest destruction of the building
19. *Trail signs* x 3 to 6 (20 words each) on house maintenance, destruction, revival and caring for home, including plastering and pigmenting practices, handprints as signs of young human life

Construction has already been on the replica buildings, and we hope to return in 2017 to finalize, design and implement the plan articulated above.

Report on Tara Copplestone's PhD research: game-based interventions

[The following section focuses specifically on Tara's own studies and hence has been single-authored by her, with minor edits by Sara. To stay true to Tara's words, we have kept her text in the first person.]

Archaeological excavations are increasingly turning towards digital interventions as part of their practice. Here at Çatalhöyük, digital technology has become part of standard operating procedure – from the edge of the trowel in excavations through to the final publication of the post-season write-up. One of the core considerations that comes up as part of the rhetoric surrounding digital technology on site is how using it can facilitate or constrain archaeological thought and process. My PhD research specifically targets the use of video-games – how the combination of narrative, visual, movement, audio and computational systems – can support, frame, or represent archaeology.

In line with this, I am particularly interested in how designing and developing video-games can offer novel perspectives on archaeological thought – whether thinking through video-game design and development can offer functionally different approaches to the archaeological process. Much of this research revolves around the role of post-processualism, and the hurdles that have stood between the theoretical approaches and its methodological or practical implementations; namely that most media forms traditionally employed in capture and recording (for example, paper-based context forms) tend towards linear representations which do not necessarily naturally support the reflexive, pluralistic or mutable aspects of the theoretical paradigm. Whilst linear media is not in itself problematic, there are certain identifiable tensions when reflexive or multivocal elements are attempted through these forms.

The video-game media form is a relatively new addition to the archaeological tool-kit, and has traditionally been leveraged as part of public forms of representation, rather than as a tool to think and construct archaeological arguments themselves. To this end, my research at Çatalhöyük involved observations, jam sessions, design sessions and preliminary development for a selection of prototype games, with the core aims being:

1. To investigate how archaeologists operate on-site and identify how current media forms afford their practice.
2. Identify areas where the affordances of the video-game media form might be leveraged to support or promote certain areas of the practice.
3. Investigate how designing video-games in the field might add novel approaches to understanding, discussing and developing ideas about the past, i.e. examine whether the video-game media form affords novel avenues for thinking about the past.
4. Assess the practicality of developing video-games whilst in the field.

Process

My primary practice was threefold. Firstly, I spent time on site observing how archaeologists moved through the excavation and interpretive process, identifying in line with this how digital technology was leveraged to afford or constrain the final writing-up of the discourse. Secondly, I identified areas of their practice which seemed particularly well aligned with the video-game media-form – namely decision making processes and subsequent post-excavation discussions. Finally, I spent an

hour every day sitting in one of the excavation areas or labs drafting out ideas for games both for and about the archaeology being engaged with. This part of the practice resulted in 18 preliminary game ideas and design briefs being drafted alongside a record of how and why these development prospects were conceived of.

Additionally, I also took time to examine site-reports, previous excavation records and in-progress excavation records, and to design video-games to tackle core themes or ideas found within these observations. This process resulted in an additional 22 games being designed in a preliminary fashion. In line with this, I also (albeit briefly) observed how visitors (including myself) navigated the site and how the current interventions supported or constrained certain interactions, incorporating these observations back into how I approached design and development at a wider level. This process resulted in an additional four game ideas being generated. To this end the process for this part of my methodology was as follows:

1. Observe archaeologists / visitors / reports / the archaeology itself.
2. Assess the ways in which the media forms and technologies are supporting or constraining elements.
3. Identify areas in which video-games might support or provide novel avenues.
4. Examine the practicality of implementing these outcomes.

As a secondary string of research I ran a “jam” session with the Visualisation Team – using themes, constraints and finds from the site to re-think traditional approaches. From this jam session I prototyped a quick system in Twine which we later gathered together and expanded upon as a way to learn the fundamentals of game-development and design (Fig. 31).



Figure 31. Tara demonstrating to the Visualisation Team (and others) how the Twine engine works and how games are developed as a result.

The preliminary jam session included the following practice:

1. Introduction to the video-game media form.
2. Introduction to the method of planning and design principles.
3. Divide into teams.
4. Hand out a theme, constraint and secret aim to each team (for example, lifecycle of houses, told through the first person, make someone laugh when you read out the design brief).
5. Spend 10-minutes brainstorming the general aim and theme of the project.
6. Spend 20-minutes prototyping, on paper, the first five options and dialogue (if any) for the game using a framework based on the Twine Engine.
7. Share your game with the rest of the team!
 - a. Read out the design brief for your game.
 - b. Read out the text options and get the team to select which branches they wish to follow.
 - c. After finishing the game once, repeat, for the other branches of the narrative.
8. Get feedback on your game from the other parties.
9. Open discussion of the experience of designing a narrative game.
10. Further discussion on the role of media.

Observations

The key observations of my primary research strand were as follows:

- Archaeologists working on site discuss their findings and processes regularly.
- These discussions – either playing out between parties, or individually – have a significant reflexive element. Their role as an excavator and the mutability of many of their interpretations is a persistent enactment, both individually and between parties.
- These discussions – relating to interpretation, subjectivity and reflexivity – tend to happen early on in uncovering a feature or object.
- As time goes, on elements tend to be talked about in a more formal and linear way.
- The tablets – whilst enabling a great many aspects of the process – seemed to formalize these decision-making processes to either a single line of enquiry or multiple single lines of enquiry: rarely did the more formalized accounts directly note the decision-making processes (though this has yet to be formally ratified through an examination of the context forms / diaries / daily sketches).
- Several of the excavators that were interviewed on site additionally mentioned that the tablets – whilst facilitating certain engagements – had a tendency to formalize their process into a linear track – that the fields and structure of the system for input formalized their practice

- Many of these individuals subsequently discussed that whilst paper was likewise bounded by its physicality, the ability to use image, annotation or unstructured text in the margins or on separate pieces of paper allowed different methods of approach.
- There seemed to be (though the interviews will need to be codified and interrogated in further detail to affirm this) a split in opinion on how valuable including multivocality, reflexivity or agency into the formalized archaeological record would be – the parties which seemed to be particularly in favor cited that these elements are important, and as such should be under consideration throughout the entirety of the workflow, not just the final stages of discussion. Those in opposition expressed the idea that the record of the practice is meant to capture the end of a strand, with the supporting evidence that enabled that statement to be formulated, rather than the decision making process itself.

Following on from this I observed that:

- The signage on site follows a largely linear track, though agency, reflexivity and subjectivity have been accounted for and explicitly implemented in a number of different areas.
 - Specifically with regards to the signage in the experimental house: elements of game design could be identified, which implored the visitor to actively exert agency in searching for hidden information in order to progress the narrative.
 - ◎ The limited amount of audience observation that I was able to engage with indicated that fairly few people instinctively followed this narrative flow (the reasons for which are varied, and relate in part to the structured nature of the tour provided by site guards and guides).
 - ◎ This brings us to the issue of normative construction and expectations with regards to how archaeology and heritage are navigated. Specifically, it raises the issue that audiences are not necessarily used to or expect to navigate these spaces in this way. To this end, for game-like or agency-oriented implementations to be successful, they need to be designed in a way which assumes no expectations or leaps of engagement from the audience: things which we take for granted when put in the form of a normal, linear sign, are not self-evident or as easily predicted through game-like interventions.
- In places where multivocality or reflexivity are accounted for within the site narrative it tends to be done through an overarching linear track: told to the audience that multiple interpretations exist, rather than embedded into the form of the intervention itself. Whilst this is not inherently problematic (and indeed has been used to great effect in a number of the signs) it does beg the question of how else we might tackle these representations: what we might gain from them, or how else our visualization practice might be altered by using them.
- Largely the approaches to telling narrative seem to be related to the constraints of the form of the media used itself – static signage or text-based guidebooks struggle to inform about these elements – in conjunction with the fact that this seems to be the more normative (and thus expected) way to engage with heritage and archaeology.

Specifically, with reference to the jam sessions I observed that:

- Thinking through games was not inherently easy, though it provided a great number of reflexive and contemplative moments: the process of learning how to think in this way opened up doors that could be further interrogated.
- A great deal of the value was derived from the process of thinking through video-games rather than necessarily the outcomes themselves.
- In part this seemed to be due to the fact that games make explicit the decision points, narrative flows and also necessitate thinking through a system – rather than just through the narrative alone.
- When archaeologists / heritage studies professionals were asked to think through games they initially found it challenging – most opting to tell one linear story and then another before realizing that the options had to be dealt with natively, from the outset, so that there was a logical flow.
- The mechanical constraints greatly helped in facilitating thinking in different ways.
- The constraints of using the frameworks got people thinking outside of what and more in line with why or how.

Outcomes and discussion

The key outcomes from my personal observations were 36 game ideas written out with an initial design brief. Of these, 10 were selected for rapid prototyping on return to England and two were initially attempted as prototypes in the field.



Figure 32. Tara designs games from the top of the South Area – observing archaeologists and taking notes on their decision-making process to inform logic trees and dialogue options in a planned game.

The process of designing the games proved to be an incredibly valuable experience (Fig. 32). However, when it came to implementation, the lack of internet made the initial design brief impossible to execute. Likewise, the physical implementation of the game in the field did not seem to yield the same initial results as the design phases. To this end it would seem that the practice of designing games – thinking through games – is incredibly valuable whilst in the field, but the return on investment related to creating them in the field needs more critical reflection and, possibly, testing. [NB. In our case, Tara did all of the technical game creation

herself, and team members watched the process; whether team members' actual physical participation in the process would yield more reward than would mere observation remains to be explored.]

Likewise, with the jam sessions; the initial prototyping was an incredibly valuable experience – in which one team member remarked with reference to the exercise: “you made me think in an entirely different way” (Fig. 33). Specifically, the implementation of constraints seemed to promote different ways of thinking about certain topics, encouraging thinking in ways outside of normative approaches. In the end, one of the games created as part of the jam went on to be prototyped in a preliminary capacity, with full development resuming on return to England. To this end, I believe

that game jam sessions – based around core subjects on a given site or archaeological practice – could provide reflexive periods that disrupt the normative approaches to practice, production and presentation. By thinking through different constraints the normative elements are made evident, and new methods are brought to the fore.



Figure 33. From left to right, Tara, Izzy and Ian participate in a jam session wherein teams are given three cards off which to design a game: a theme, a constraint and a secret aim.

potential for using them to think about archaeology is immediately apparent. Less immediately apparent, however, is the value of developing *in situ*, the constraints on technology, time and networking being prohibitive to effectively implementing design specifications from the offset. Further research into how game-based interventions and the practice of their design and development is required to further test and engage with these preliminary findings, though the initial results indicate that there is potential and value in pursuing this line of enquiry further.

Acknowledgements

As always, we depend on almost all members of the Çatalhöyük Research Project for various types of support, and we are indebted to more people than can be listed here. Ours is a complex, cooperative form of practice that depends upon the good will and interest of others, and we are particularly grateful to the following individuals for going above and beyond in terms of their kindness and investment in our process and our team: Bilge Küçükdoğan, Ali Kavas, Levent Özer, Hakan Özer, Jason Quinlan, Katy Killackey, Dominik Lukas, Scott Haddow, Burcu Tung, James Taylor, and especially the site guards İbrahim Eken, Mustafa Tokyağsun, and Hasan Tokyağsun.



Research Projects

Chapter 22

Çatalhöyük Digital Preservation Project

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The work conducted on the East Mound at Çatalhöyük in the summer 2016 constitutes the first phase of the Çatalhöyük Digital Preservation Project (CDPP). CDPP is a new research initiative funded by the Archaeological Institute of America (AIA) and by the 2016 University of California Office of the President's Research Catalyst Award led by Tom Levy at UC San Diego (Prime Award No: CA-16-376911) that aims to develop and experiment a new approach to archaeological heritage conservation. Our objective is to design and test new methods and technologies for earthen architecture conservation based on quantitative monitoring, remote sensing data capture and processing, spatial analysis, and visualization. Tools and methods employed in the field season 2016 span environmental data loggers (Tiny Tags), terrestrial laser scanning (TLS), thermal infrared (IR) imaging, and augmented reality for mobile devices.

New research

After a preliminary experimental phase involving Building 5 showed great potential during field season 2015 (Fig. 1), our team spent the initial part of 2016 designing a systematic methodology of capturing informative and constructive data. Part of this effort was to explore the potential of thermal IR imaging in the monitoring of Çatalhöyük buildings. Although the employment of thermal cameras is relatively new in the field of earthen architecture conservation, the potential of using thermal IR (Grinzato 2012) or multispectral and hyperspectral imaging (Fischer and Kakoulli 2006) in conservation or in the monitoring of historic structures (Avdelidis and Moropoulou 2004) has been extensively discussed. While our effort is still undergoing development, during the 2016 season we carried out extensive testing to verify the suitability of thermal infrared (IR) imaging in our workflow.



Figure 1. High-quality triangular mesh 3D model of Building 5 generated in 2015 using ground photography and Structure from Motion techniques.

The objective of this monitoring experiment was to employ a thermal IR camera to record the thermal capacity and thermal inertia of the mudbrick and plaster component of specific walls in the North Area and verify the presence of moisture in such materials. The current hypothesis is that a higher concentration of moisture in the lower part of the wall found in the *in situ* Çatalhöyük buildings is one of the main factors that determine basal erosion and wall undercutting. Fluctuations

in the environment within the shelters causes cycles of condensation and evaporation, these cycles on a diurnal and annual basis lead to humidification and desiccation of the earthen archaeological substrate (Dayre and Kenmogne 1993).

Moisture fluctuations create additional problems with the soluble salts identified within the earthen architecture, salts cause deterioration by way of crystallisation, which are process known as efflorescence and subflorescence. Conditions such as high humidity or rising damp lead to soluble salts transitioning to the liquid phase in a process called deliquescence, this liquid phase salts to migrate through the substrate by capillary action, finally once the humidity drops below the deliquescence point the salt re-crystallises causing mechanical damage (Keefe *et al.* 2000). These are among the main conservation issues recorded on-site that contribute to determine an acceleration of the decay of the earthen structures. In 2016, we started our thermal IR survey from B.5; we chose this building because its location, at the northwest edge of the North Shelter, makes it particularly sensitive to erosion, environmental agents, and decay. Our choice was also driven by the preliminary results of our terrestrial laser scanning point cloud comparison using data from B.5 that shows a substantial loss of surface material in walls F.230 and F.231 in the period 2013-2015. Please see more details in the section 'Continuing Research' below.

In addition, during season 2016 our team also collected sample thermal IR images in Building 4 and Building 80 in the South Area.

While the issue of rising damp is a well-documented architectural phenomenon (Building Research Establishment 1975) an additional corroborative experiment was carried out in the conservation laboratory with the thermal infrared camera (Fig. 2). Analogue mudbrick, natural marl (plaster), and analogue mudbrick with pigmented plaster were used to compare the thermal signatures of bone dry materials to those exposed to moisture. Once the samples were exposed to water the surface temperature instantly cooled. The cooling effect could be seen migrating through the sample, creating a pattern not dissimilar to the patterns seen on the in-situ archaeology on-site. Using a powerful halogen lamp, we artificially heated the analogue materials to measure the thermal response of the samples with the aim to detect the areas with higher concentration of moistures. Our experiment relied on high-frame rate thermal imaging (24 fps) to detect thermal response in the different sample. Using this method, we recorded approximately 1,100 thermal IR images per sample. Further investigative work needs to be done to examine the impact of soluble salts on the thermal infrared data using the software MATLAB.



Figure 2. View of (a) Çatalhöyük Digital Preservation Team performing experimental thermal infrared imaging in the Conservation Lab and (b) analogue mudbrick with pigmented plaster, analogue mudbrick, and natural marl samples used in the experiment.

2016 thermal IR survey

In 2016, we employed an ICI 9640 P—a compact, high-end thermal infra-red camera manufactured by Infrared Camera Inc. (ICI)—to survey B.5 (see Fig. 3). The ICI 9640 P features a vanadium oxide detector which is able to record thermal properties of materials and cultural objects in an array of 640x480 pixels at 30 Hz/s. The spectral response of the instrument is 7 μ m-14 μ m, its temperature range is -40°C to 200°C with an accuracy of $\pm 1^\circ\text{C}$ and its thermal sensitivity of 0.05°C at 50°C. Featuring a 14mm wide-angle lens and a fairly large detector (640x480 pixels), this thermal IR camera allows to survey entire features and walls.

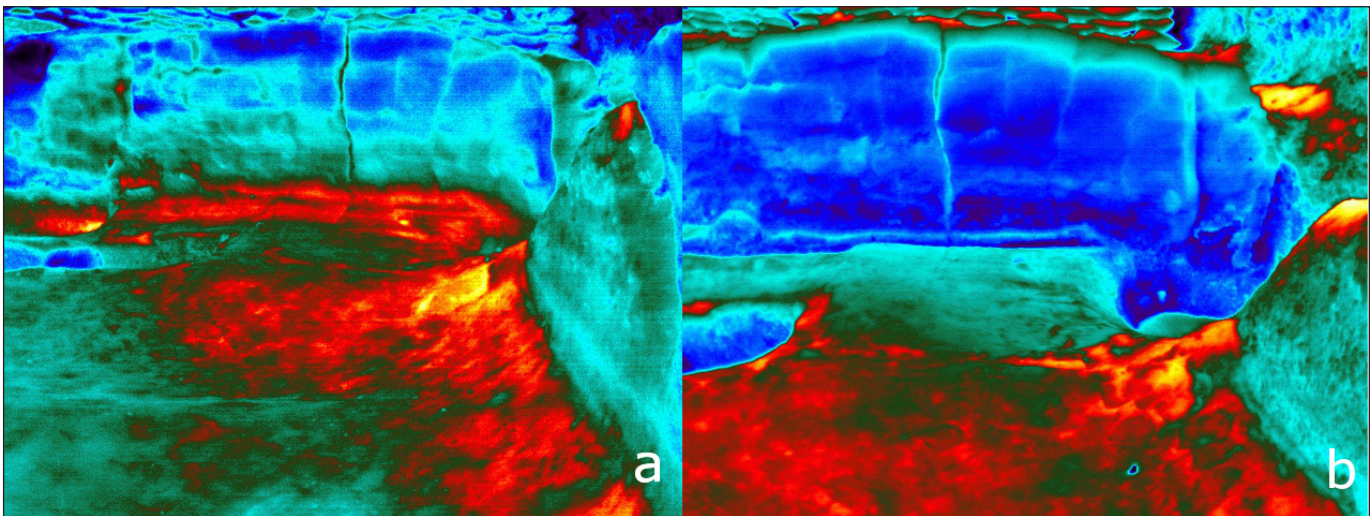


Figure 3. Thermal infrared imaging showing thermal capacity of the wall feature 230 in B.5 recorded (a) at around 9 am and (b) at around 12 pm; our data shows lower temperature at the interface of the wall and floor and in the lower part of the wall. This find supports our hypothesis on higher concentration of moisture in the lower part of F230.

Using the above mentioned thermal imager, we recorded the temperature of entire sections of wall features to detect specific areas with different thermal capacity overtime, an indication of moisture. For instance, we recorded the thermal signature of the lower part of F.230 in B.5 at 9:00 am, then again at 11:00, at 1:00 pm and at 10:00 pm with the aim to detect a change in temperature differential in the basal part of the wall at different times. Our hypothesis is to verify whether wet areas of a wall, containing a higher percentage of moisture, change temperature less rapidly than dry areas. A total of 162 raw infrared images with a resolution of 640x480 pixels were successfully recorded in B.5 at different time of the day and night. Future work will focus on analyzing such thermal IR imagery in the computing environment MATLAB to calculate variance maps from our datasets that will help us to better identify moisture content in wall features in-situ.

Augmented Reality (A/R) app for conservation team

Another exciting aspect the project is focusing on is amalgamating qualitative and quantitative data sets collected by the Conservation Team over the years into a user-friendly augmented reality (A/R) fieldwork tool for tablet PCs or mobile phones (see Fig. 4). Work is being carried at UC Merced, under the UC President's Research Catalyst grant, to design and develop an A/R mobile app able to integrate 2D and 3D content as well as metadata stored in the Conservation Database into a single device. Currently, developers at UC Merced are advancing the implementation of the app in the game development platform Unity 3D leveraging the A/R plugin Vuforia.

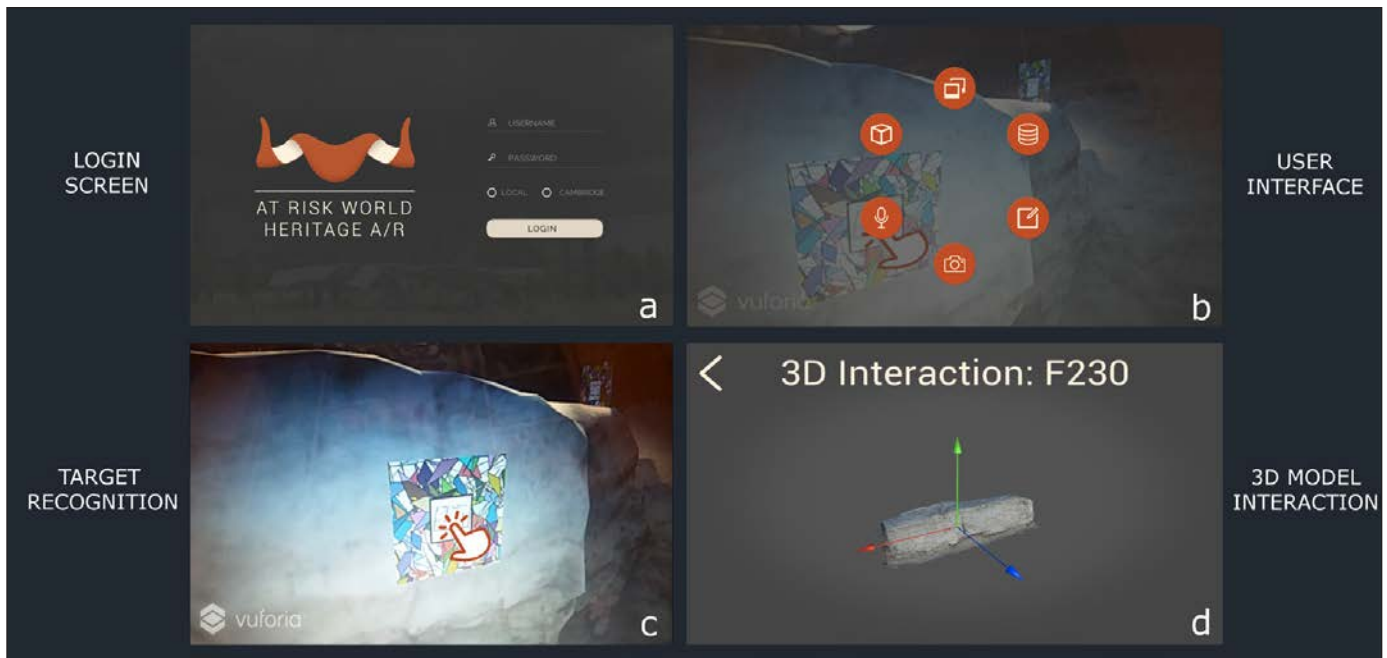


Figure 4. Snapshots illustrating some of the features of our custom-designed augmented reality app showing (a) Login Screen; (b) Wheel-based User Interface; (c) Image Target Recognition and (d) Interaction with 3D model.

Our goal is to enable conservators to browse monitoring observations, TinyTag data, pictures, thermal IT imagery, previous annotations while on-site using our app on a Microsoft Surface tablet or Android cell phone. By overlaying digital metadata, 3D models, and quantitative information over a wall feature, we aim to provide conservators with redundant sets of information that enables in-depth and multi-modal monitoring (Lercari *et al.* 2016). Preliminary testing of an early alpha version of the app has been carried out during season 2016 to test the viability of image-based targets in B.5. Paper A/R targets were attached to F.230 and F.231 while an Android device was used to test the feasibility of the target detection with the natural lighting condition in the North Shelter. Connection testing between the app and the local server has also been conducted on-site to verify the viability of employing the app as a monitoring tool for the Conservation Team. We plan to finalized the testing of the A/R app during field season 2017.

Continuing research

Ongoing aspects of the project were carried out successfully. During the 2016 season, 69 terrestrial laser scans were recorded in the North Area and 68 scans in the South Area to measure the surface, topology, and texture of Çatalhöyük buildings, walls and other features located inside the permanent shelters. The TLS data collected in 2016 are particularly relevant because they complement a historical series of terrestrial laser scanning data that we started collecting in 2012 (Forte *et al.* 2015; Lercari in press). Our TLS data show the progression of the decay of the North and South Areas over a period of five years (2012-2016) (see Fig. 5).

In the summer 2016, our team processed and compared a large amount of point cloud data in order to provide a quantitative visualization of the surface erosion in a number of buildings in the North Area (e.g. Buildings 5, 48, 49, 55, 64, 114, and 119) (see Fig. 6). A FARO Focus 3D S120 shift-phase laser scanner was employed on-site to perform this type of survey. As of October 2016, we

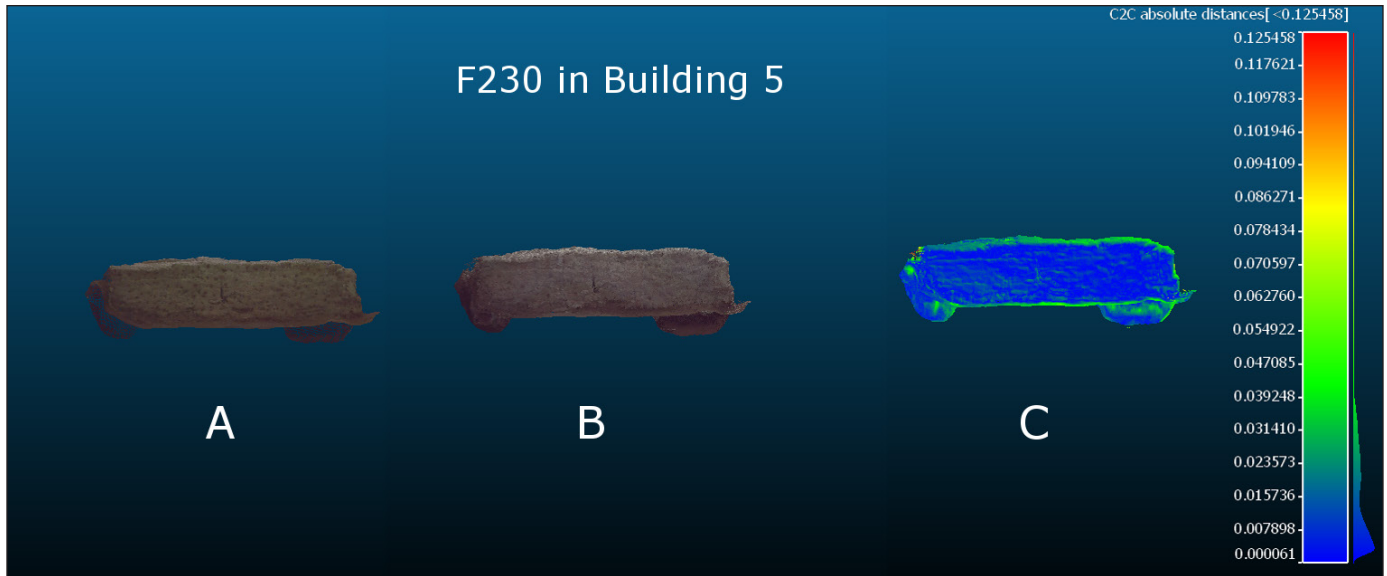


Figure 5. (A) shows a point cloud of wall feature F230 of Building 5 in 2012. (B) shows a point cloud of Wall 230 of Building 5 in 2014. (C) shows the scalar field of the wall between the 2 years. The scalar field shows about a 2cm difference in the upper and lower parts of the wall, shown in green.

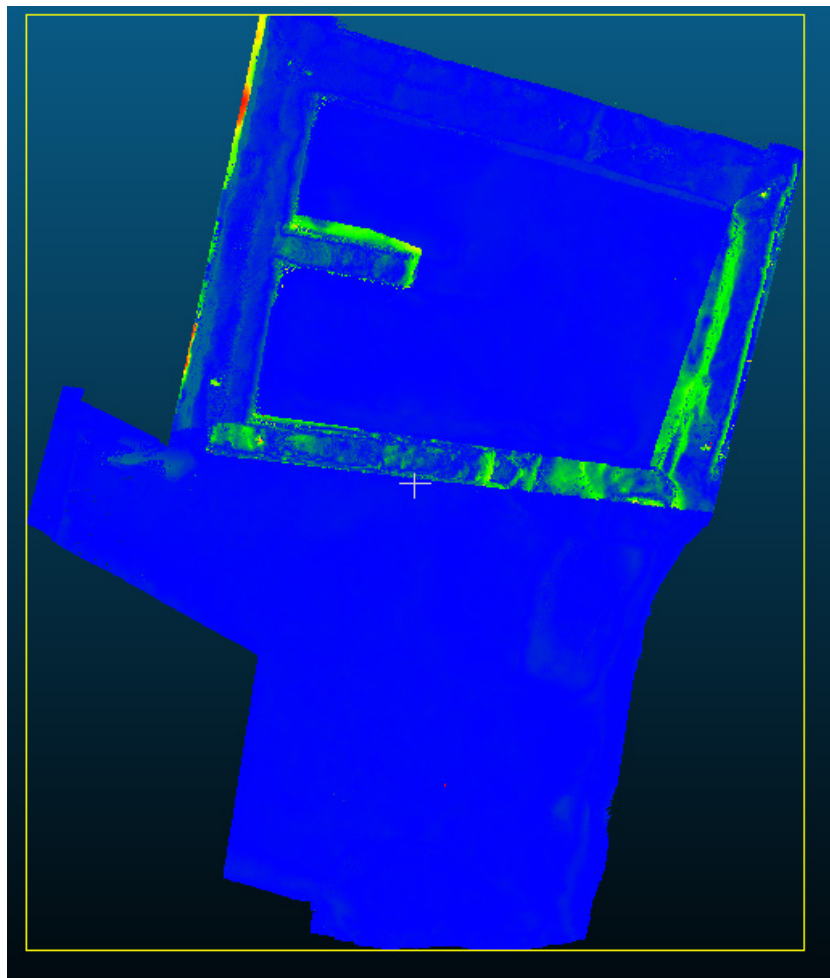


Figure 6. Scalar field visualization showing terrestrial laser scanning point cloud comparison of B.82 in 2012 and 2014.

completed the post-processing of a number of buildings recorded by terrestrial laser scanning in in the North Area in 2012 (Buildings 1, 3, 48, 49 and 77) and 2014 (Buildings 1, 3, 48, 49, 54, 55 and 82).

Our team also completed the comparison of scans recorded in 2012 and 2014 of the following wall features using the software Cloud-Compare: F.1655, F.1657, F.1660, F.1661, F.1668, F.1590, F.1591, F.1592, F.1613, F.1614, F.1615, F.1616, F.1617, F.1807, F.1818, F.1820, F.1821, F.1824; other feature types were also compared as follows: F.1812 (oven); F.1810 and F.1829 (platforms). We are planning to complete an additional set of sixty comparison of features recorded in 2013, 2015, and 2016 in the same buildings listed above before next season.

Future research

During the 2017 season, work will focus on implementation and training. Given that the 2016 season was curtailed collaborative outreach was unable to be carried out with either the local museum staff or universities. As a result, these activities will be the main focus of the project during the following two seasons. Further imaging and laser scanning will continue as part of the data collection, but the aim over the course of the off-season will be to integrate the current data into the augmented reality application so the system can be implemented at the site. Additional text panels will be added in the 2017 season to promote conservation practices at the site and heritage preservation.

Conclusions

The Çatalhöyük Digital Preservation Project aims to create the type of holistic monitoring needed at a site as complex as Çatalhöyük. This project seeks utilize new tools for heritage preservation focusing on conservation to enhance preventive measures, and hopes to offer a best practice methodology that is easy to implement which can be used at other earthen sites. This project is a key component of the legacy the Conservation Team plans to leave in place for the team taking over in 2018.

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Chapter 23

Modelling Chronology

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Over the past year steady progress has been made on the scientific dating programme for the South Area. What was a skeleton suite of radiocarbon results through the entire mound (from B.10 to Sp.181) has now been expanded to provide a strong, well-replicated spine of dated deposits that will provide the backbone of our model for the chronology of the East Mound. The re-analysis of the Mellaart stratigraphy, using recently acquired plans from the 1960s excavations which were kindly lent to the project by James Mellaart before his death is now almost complete. Only the final integration of this archive of buildings with those recorded by the current project over the past 25 years is pending (this will now be finalized after the 2017 field season). Our revised understanding of the sequence excavated in the 1960s has allowed strands of buildings and spaces that can be stratigraphically related to the central spine of the South Area model to be identified. These will be the focus of the samples submitted for dating in the coming year.

Following the assessment of the North Area in May 2015, the first suite of samples from B.77 and related spaces has been dated. The 2016 field season was particularly focused on locating and sampling suitable materials for completing the chronological model for this area during 2017. The first samples have also been submitted for dating from the TPC and GDN Areas. This should enable stratigraphically earlier buildings and open areas to be added to the published model for the TP Area, thus increasing the temporal overlap of this model with that for the latest deposits in the South Area. Further samples were located from these areas during the 2016 season, although sampling cannot be finalized until the excavation of these areas has been completed and the record integrated with those of Mellaart's Area A.

In addition to dating of samples from Neolithic deposits, in 2015/16 samples were also dated from a number of post-Neolithic human burials across both the East and West Mounds. This work should be completed later this year.

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Chapter 24

GDN Research on the Late Neolithic Architecture

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with contribution by Katarzyna Regulska

This paper presents a short summary of 2016 field work with regard to GDN research on Late Neolithic architecture at Çatalhöyük East Mound (see Barański 2013, 2014; Barański *et al.* 2015). The main objective of this work was to connect the excavations of the Çatalhöyük Research Project within the TP Area (Marciniak and Czerniak 2012) with those of James Mellaart (Mellaart 1967). It was equally important to collect mudbrick samples for complex geoarchaeological analysis and social interpretation of selected houses (see Love 2012, 2013).

Major discrepancies between the methodological and theoretical approaches of Ian Hodder and James Mellaart make comparing the spatial data and architectural characteristics unusually challenging (Farid 2014; Hodder 2016). Some 1960's plans were used to provide a spatial context for the TP Area, however that process was not entirely successful because of generalization and mistakes of earlier data as well as limits of research on architecture within the TP Area. For example, reconstructions of the spatial arrangements were difficult to perform because of significant and diverse post-depositional damage to all of recorded built structures. Also, the size of the TP Area was relatively small. Consequently, no complete buildings were identified. All this made it exceptionally challenging to fully define and examine the architecture. Consequently, new excavations and architectural research which would use contemporary tools and techniques were needed to refine our knowledge of the spatial layout of Late Neolithic settlement.

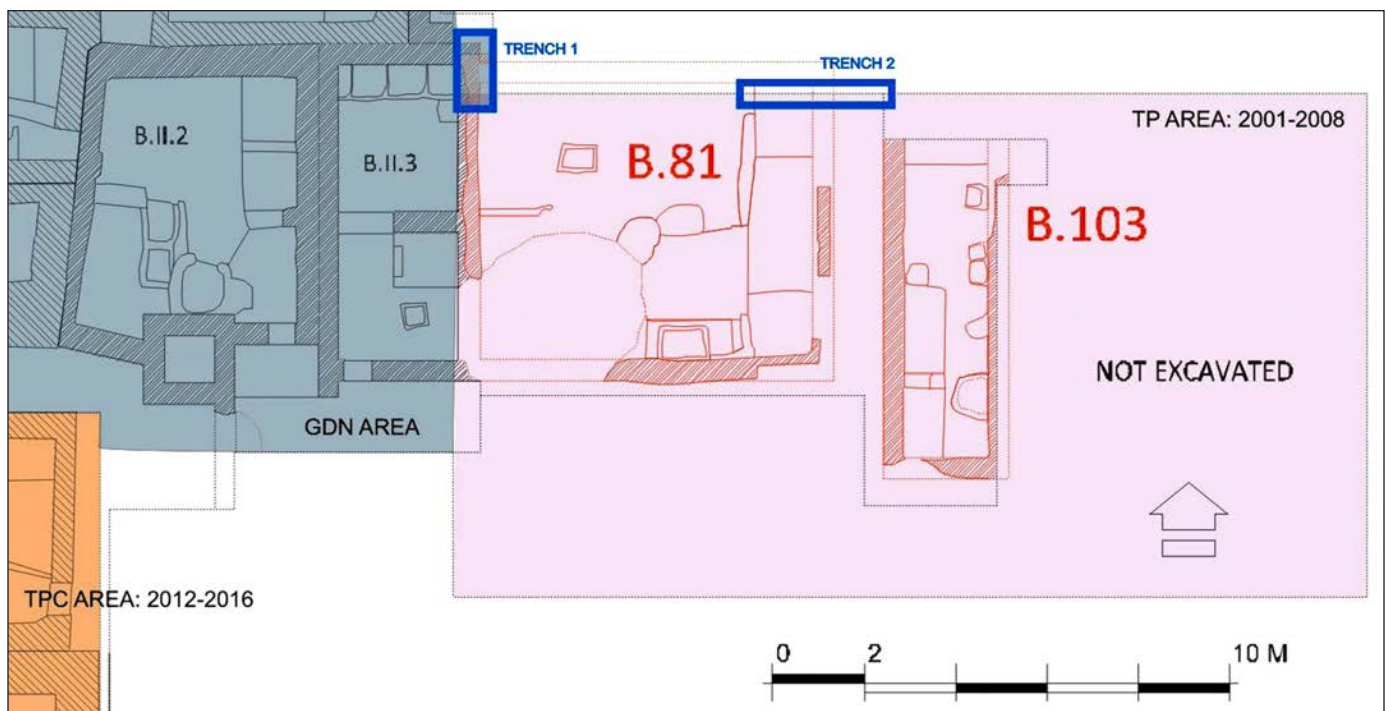


Figure 1. Plan of 2016 excavated areas in the GDN Area (plan Marek Z. Barański).

Two small trenches were opened at the edge of the TP Area resulting in re-exposure of the northern section and reaching foundations, walls and floors of the most of the TP buildings. The exact location and size of these trenches is shown in Figure 1.

Trench I

Trench 1 (opened in 2015) constituted about 1.8m extension to north alongside western foundation/wall (F.2860 and F.2888) of building B.74 in the TP Area. The coordinates of the corners of this trench were as follows: 971.15 E/995.90 N; 972.15 E/995.90 N; 972.15 E/994.00 N; 971.20 E/994.00 N (Fig. 2).



Figure 2. Overview of Trench I in the GDN Area: as seen from the west (to the left) and from the south (to the right) (photo Marek Z. Barański).

A pebble inlaid floor (F.6020) of house B.81 constituted a bottom of Trench 1. This surface was defined by simple walls (F.2874 and F.2876) that made up a north-west corner of the main room (Sp.440) of the building. The western wall (F.2874) was truncated along most of its length to the level of the floor as a result of the 1960's excavations (see Mellaart 1962). It was bonded with the northern wall (F.2876) which stood up to about five brick courses and was covered with multiple layers of whitish lime wall plaster. All these structures were made up of mostly gray (5Y 7/1) but also very pale brown (10YR 7/4) mudbricks with a dominant sand component. Also, the western face of the western wall (F.2874) was coated with sandy pale brown (10YR 7/4) makeup that was sealed with a

final and thin layer of marl plaster. This kind of wall finish characterized the western annex (Sp.555) of B.81 which was documented in its entire plan in 2015 season (see Barański *et al.* 2015). It is worth recalling that the annex is recorded on the 1960's plans as building B.II.3 (see Mellaart 1962: Fig. 3).

The pebble inlaid floor F.6020 was sealed with a phytolith-rich layer and rubble which, most likely, constituted a part of a roof collapse (17613). These deposits were then overlaid by midden-like layers (15888 and 17603) that seemed to accumulate to the height of at least 0.7m over the floor level.

The midden was truncated by a foundation trench (F.3195) for a compound mudbrick structure (F.2882) of house B.74. Interestingly, this architectural feature was situated about 0.6m to the east from the remnants of the eastern wall (F.2874) of the main room (Sp.440) of B.81. However, the northern wall (F.2876) of the latter served as a foundation for B.74. The compound structure (F.2882) abutted the internal face of the northern wall (F.2876). More importantly, it was bonded with a simple wall (F.2860 and F.3577) which was built on top of the remnants of B.81 and continued to the south on top of the compound foundation. The preserved height of the simple wall was four mudbrick courses. These blocks were yellowish brown (10YR 5.4) and silty clay just as the bricks in underlying structure. Unfortunately, both these architectural features of B.74 were partly truncated from east by a deep post-Neolithic pit (F.1195). Therefore, the stratigraphic relationship between the simple wall and the compound foundation on one side and TP floors on the other was problematic. There was only a narrow stretch of a pebble inlaid floor (F.3133/F.3135) recorded. It was constructed along the most upper course of the simple wall (F.2860).

The western wall (F.2860) of B.74 was abutted to the west by another, most probably later mudbrick structure (F.8053). The latter was partly truncated during the 1960's excavations and had largely eroded since then. Therefore, its brickwork was difficult to examine. It is possible, though, that this foundation/wall was a compound structure of yet unspecified building to the west of B.74.

The uppermost architectural feature recorded within Trench 2 was a part of a possible foundation/wall (22862). Unfortunately, the primary dimensions and alignment of this feature were not possible to define due to severe erosion. Also, it is likely that these were the remnants of an unspecified post-Neolithic built structure which was constructed on top of infill (22863) that sealed an older foundation/wall (F.8085). The latter most probably constitutes a south-west corner of an unspecified building adjacent to the north to B.81. This structure was made up of silty clay and strong brown/light yellowish brown (7.5YR 5/6 and 2.5Y 6/3) mudbricks. It was truncated by a foundation trench (F.3195) for B.74 and underwent only a partial excavation.

Trench 2

Trench 2 constituted about 0.5m extension to the north to the TP Area in a place where eastern external foundations/walls of most of the TP buildings were situated. The coordinates of the corners of this trench were as follows: 922.25 E/994.25 N; 980.75 E/994.25 N; 980.75 E/993.75 N; 977.25 E/993.75 N (Fig. 3).

The bottom of Trench 2 was defined by pebble inlaid floor (F.6020) of the main room (Sp.440) of house B.81 – the earliest building in the TP sequence (Czerniak and Marciniak 2008). This discrete surface continued to the north and west behind the excavation limit. The floor was sealed with some deposits (17600). However, both the roomfill and the floor were not preserved in the eastern part of the trench as these layers were truncated by foundation trench (F.3195) for house B.74. A compound mudbrick foundation (F.2884 and F.3576) was situated within this depression in the



Figure 3. Overview of Trench 2 in the GDN Area as seen from the south (photo Marek Z. Barański).



Figure 4. Closeup view of compound foundation F.3576 and simple wall (F.3577) as seen from the south (photo: Marek Z. Barański).

ground. This structure had a form of stepped foundation which descended towards east and most likely made up the north-eastern corner of B.74. Interestingly, it did not seem to continue behind the eastern limit of the excavation.

A simple mudbrick wall (F.3577) was constructed directly on top of the compound structure (F.3576) (Fig. 4). These two features appeared to be built with the same building material which is something yet to be verified by a geomorphological analysis. Nevertheless, the silty clay bricks were yellowish brown (10YR 5.4) and most of them seemed to be about 0.75m long, 0.42m wide and 0.09m high.

The simple wall was preserved up to nine brick courses in its western part and between one and none brick courses in the eastern part. The varied height of this structure was a result of severe post-depositional damage. This mudbrick feature was truncated at first by foundation trench (F.1941) for another building and later on by a large post-Neolithic pit.

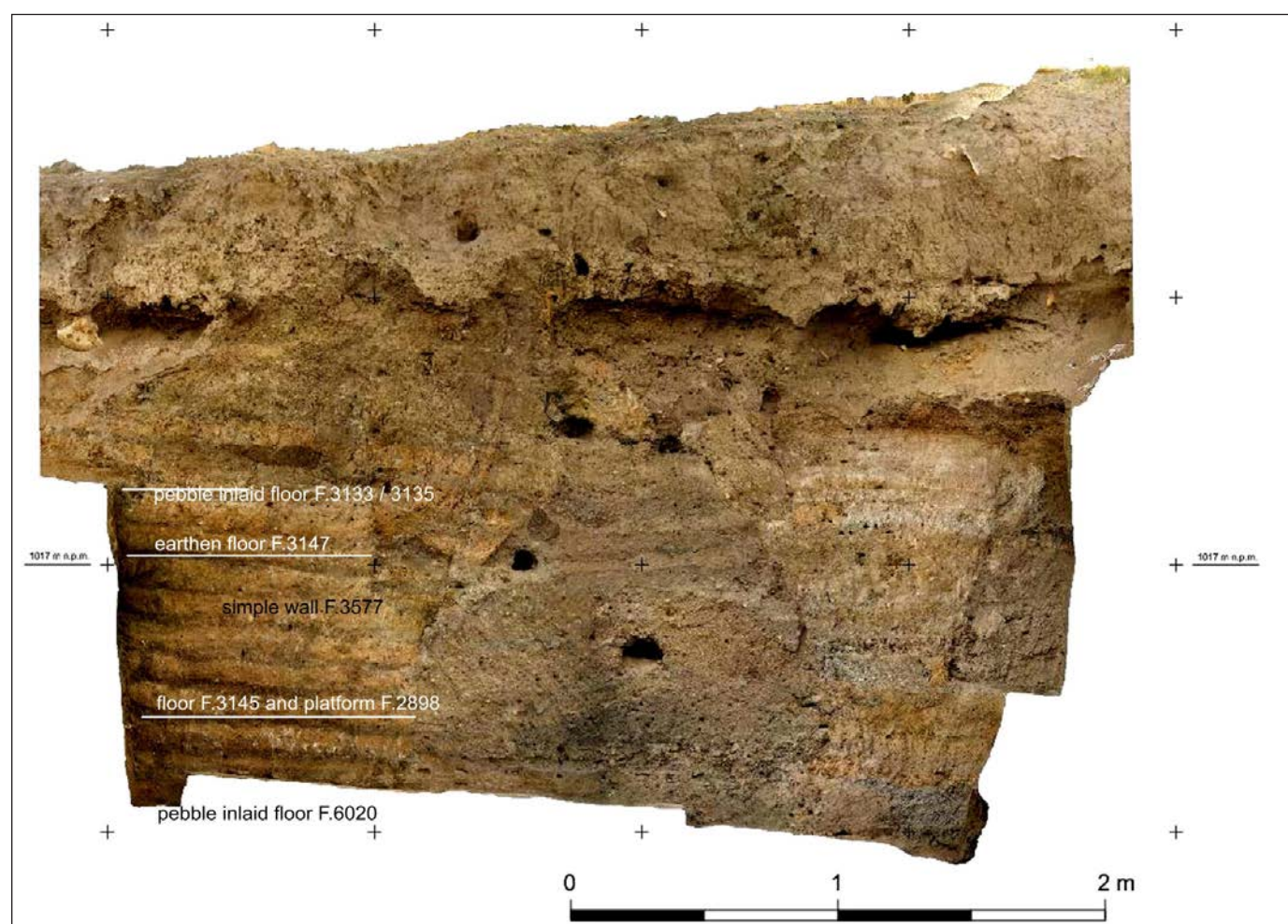


Figure 5. Orthophoto of the southern section of Trench 2 with information on location of selected TP floors (illustration: Marek Z. Barański).

Most of the TP floors (e.g. F.3145, F.3147, F.3132 and F.3133/F.3135) (see Czerniak and Marciniak 2006; Marciniak and Czerniak 2007) were related to the simple wall (F.3577). All these surfaces had a physical relationship with this mudbrick structure (Fig. 5). Starting from the bottom up, most northern remnants of the earliest floor (F.3145) and platform (F.2892) of B.74 were recorded (Fig. 6). These features were made up of a makeup layer and a thin and compact clayish surface sealed with

some phytoliths. Also, a cattle scapula was found directly underneath the platform and may be considered as a foundation or a commemorative deposit. The floor and the platform were sealed with roomfill of up to 0.5m in thickness. Subsequently, two other earthen floors (F.3147 and F.3132) together with well-defined orangish and silty makeup layers were recorded (Fig. 7). However, in this case, these surfaces were separated by much less thicker deposits. The last of the floors mentioned was covered with a layer that constituted a makeup for a final pebble inlaid floor (F.3133/F.3135) (Fig. 8) – kind of a feature that seems to be one of the most characteristic architectural innovations in the TP Area (Czerniak and Marciniak 2012).



Figure 6. Closeup view on earthen floor (F.3145) and platform (F.2892) as seen from the south (photo: Marek Z. Barański).

The eastern extent of the above floors is not clear due to truncation by post-Neolithic pit. Additionally, the pebble inlaid floor (F.3133/F.3135), the upper part of foundation/wall (F.3577) of B.74 as well as overlaying deposits ((11511) and (11528)) seem to be cut by a foundation trench of unspecified built structure. This building is represented by two courses (and at least two unbound rows) of pale brown (10YR 6/3) and silty clay mudbricks (F.3115) that seemed to be contemporary with partition walls (F.3113 and F.3114). It is, however, likely that the foundation / wall (F.3115) is actually a compound structure (see Barański 2014: Fig. 19.4). Even more interestingly, this foundation/wall appeared to be the same as massive mudbrick foundation/wall (F.2873) excavated in the eastern part of Trench 2. The latter was situated within a deep foundation trench (F.1941) and was preceded by an intentionally dumped rubble (17805), including fragments of bricks and platforms mixed with plasters, mortars and soil. It is worth noting that the thickness of this diversified makeup layer exceeded 0.8m (Fig. 9). The compound foundation/wall (F.2873) itself was badly preserved. There was a deep and wide crack in this feature that might have been a result of a construction disaster.



Figure 7. Closeup view on earthen floor (F.3147) as seen from the south (photo: Marek Z. Barański).



Figure 8. Closeup view on pebble inlaid floor (F.3133/F.3135) truncated by a foundation trench for unspecified building (photo: Marek Z. Barański).



Figure 9. Closeup view on a rubble layer (17805) underneath a compound foundation (F.2873).

The crack was filled with various deposits, including small fragments of bricks and bits of whitish plaster.

The above infill layers were truncated by a foundation trench for highly problematic building B.34, which is situated at the top of the TP Neolithic sequence (see Czerniak and Marciniak 2003). The exposed and heavily damaged foundation / wall (F.3106) was set on a layer of rubble and had only three courses of diversified mudbricks. However, it was clear enough that this feature was bonded with eastern wall (F.3111) of Sp.248 (see Czerniak and Marciniak 2005). This stratigraphic relationship proves that the foundation /wall of B.34 could have originally been a compound and one-and-half-brick-thick structure.

The remnants of TP Neolithic architecture were sealed with various deposits that made up the over one metre-thick post-Neolithic sequence. These layers, including foundations/walls of most probably Roman or Hellenistic building B.30 (?), were heavily eroded and were not excavated. The only exception is a large and deep pit with clearly stratified infill deposits which were partly removed.

Conclusions

Now, the following outline of the comments and remarks on the late Neolithic building sequence can be presented at this stage of research:

First of all, the northern edges of main rooms of TP buildings B.81 and B.74 are situated about 0.5m to the north of the original TP excavation limit. It is very likely that the recorded mudbrick (F.2876 and F.3577) walls constitute at the same time the northern limit of these buildings. Also, it seems that B.81 and B.74 were abutted from the north by other built structures.

Secondly, TP compound mudbrick structures, popularly and incorrectly named as “double walls”, were actually partly earth-sheltered foundations or foundation walls which served load bearing and simple walls. Similar building strategies are, in fact, documented in other excavation areas with regard to a few late Neolithic houses, for example: B.10, B.44 and B.142 (Barański *et al.* 2015; Regan 2014). Both compound and simple structures with regard to TP buildings seem to be built with the same building material. However, the bottom of foundation trenches situated within midden and midden-like areas were often layered with rubble.

Thirdly, late Neolithic buildings rarely if at all were constructed on flat surfaces. The existing mound slopes required additional effort and implementation of various building strategies, including digging foundation trenches, partial ground leveling, constructing stepped foundations etc. For example, some parts of buildings are often erected at different ground levels. Consequently, floor elevations of different spaces within the same house may vary. Also, some neighbouring mudbrick structures erected at the same level do not have to be contemporary. These observations put the level system introduced by James Mellaart (Mellaart 1967) into further dispute.

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