

Database Logistics

This year we were able to link directly to the live database during the season using the newly released Filemaker Pro 9. Sarah Jones successfully tested and implemented a live ODBC link between the Main database and FMP during the season, which we used to enter and edit data directly into the main database. This means that we were able to retain our own FMP database complete with images instead of switching to Access, which only runs on PC platforms. In previous years we worked on a stand-alone database during the season and uploaded the results at the end. The new FMP version now allows us to be dynamically linked to the main database and also download a static version, with images, with us to draw from during the year for the purposes of research and publication. Currently, Sarah is configuring the system such that it will be possible to link up to the main database remotely. This year we were also able to fill in almost all of the missing photographs for the database. At the end of last season we were able to secure photographs for all the Ankara materials for the first time and so we entered these, coupled with the extant Konya photographs. We continued to edit the existing records removing examples of clay scrap or shaped clay where possible. A more rigorous system in heavy residue identification has assisted us enormously and we spend much less time on average sorting through unidentifiable and minute samples.

We also revisited the problem of accurately recording clay figurine fabrics and determining heat exposure. While Chris Doherty has been able to observe some general characteristics of figural clays (see our summary in Nakamura and Meskell 2006), he notes that the rigorous and accurate recording of figurine fabrics pose a distinct difficulty without the possibility of destructive analysis. However, he has suggested that petrographic characterization by hand, while more limited, is both possible and desirable, but would require someone with a good understanding of the local geology. He is currently offering this study as a M.A. project to students in the Archaeological Science program at Oxford University. In 2009, we hope to work closely with such a student and integrate their analyses into the Clay Fabrics section of our database. Such information would be potentially interesting to those interested in studying clay materials across various industries or figurine manufacture in general.

Specific Finds

This season some 50 figurines were excavated and recorded. We also entered records for figurines identified from heavy residue or flotation found in previous years that were sent to us in this season some large and notable pieces such as 13183.H1, 13161.H1, 13161.H2 and 13161.H3. The bulk of our finds correspond to general types previously identified within the broad range of anthropomorphic, zoomorphic and abbreviated forms. Some new 'subforms' that we noted this year included a flattened type of figurine plaque such as 13183.H1 and 17049.X1. 13183.H1 shows a human hand and lower part of the arm in a raised appliqué style overlying a flattened body of either anthropomorphic or zoomorphic body. Perhaps this form resembles the leopard and human examples now in the Ankara Museum that are similarly flattened in profile, although ours are not discernable as any particular animal and may indeed be part of the human body itself.



Figure 142: A flattened type of figurine plaque

Another notable example from this season was a miniature figurine from TP (15839.X10) delicately carved from stone, possibly steatite with a grey-green tint (1.61 cm H, 1.2cm W and .82cm T). This tiny and complete female figurine exhibits very exaggerated thighs that are voluminous and fleshy. While there are no explicit breasts indicated, the arms are underscored by a fine, incised line. A pubic triangle is represented and incised as part of the demarcation of the legs. In fact most of the bodily detail is accomplished with great economy of line. The buttocks are exaggerated, detailed and the overall form is the 'shelf-bottom' that we have increasingly noted throughout the corpus. Incised lines demarcate the legs. The head is just a simple knob lacking in any detail. The overall shape is a triangular form that emphasizes the fleshy female, human form.



Figure 143: Miniature figurine from TP Area 15839.X10

Body Typing: Quantifying Forms and Features

This season we also completed work started earlier in the year on the quantification of body parts present on all anthropomorphic and abbreviated figurines. This forms the basis of an invited paper for the *Journal of Archaeological Method and Theory*.

We should first point out that the conventions of emphasizing certain body zones and traits or alternatively, pairing down bodies to simple forms or silhouettes, are not only characteristic of Çatalhöyük figural practices, but also to Anatolia more broadly during Neolithic times (see Badisches Landesmuseum Karlsruhe 2007; Özdoğan 2003). These different practices of exaggeration and abbreviation likely addressed or articulated different, but not necessarily incompatible, ideas or values.

Table 12

Table I. Anthropomorphic and abbreviated figurine forms by traits. Totals reflect number of diagnostic figural objects. 'Hair/cap' describes the head ornament that is more rounded and/or rimmed, see Fig. x. 'Adornment' includes clothing, body markings or jewelry. 'Phallus' refers to an aspect of the form rather than its depiction on the body. 'Head element' refers to pointed and/or folded shapes on the head see Fig. x.

	Anthropomorphic traits										Abbreviated traits							No. Figs with Features	Total No. Figs
	Breasts (Br)	Buttocks (Bu)	Belly (Be)	Navel (N)	Pubic Triangle (PT)	Fingers (F)	Parted Hair (PHa)	Headless (Hh)	Phallus (Ph)	Beard (Be)	Clothing/Body Adornment (C/A)	Puncture Marks/ Hair (PM/Ha)	Hair/Cap (H/C)	Folded Head-Element (FHE)	Pointed Head (PHe)				
Anthropomorphic	59	45	39	19	4	14	2	21	2	3	9	3	10	0	0	88	164		
Abbreviated	0	0	0	0	0	0	0	0	0	1	1	1	7	29	9	48	237		
Anth-Ab Crossover	5	5	0	0	0	0	0	0	1	0	1	0	3	4	1	14	18		
Ab-Zoo Crossover	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	13		
Other-Phal Crossover	0	0	0	0	0	0	0	0	8	0	0	0	1	4	1	15	15		
Phallomorphic	0	0	0	0	0	0	0	0	8	0	0	0	0	0	0	8	8		
Feature Totals	64	50	39	19	4	14	2	21	19	4	11	4	21	38	11	174	218		

Table 13

Table II. Correlations and occurrences among depicted traits for anthropomorphic figurines. Grey boxes indicated the number of times the trait occurs alone.

	Breasts	Buttocks	Belly	Headless	Navel	Fingers	Head Adornment	Body Adornment	Pubic triangle	Beard
Breasts	18	25	25	12	5	8	2	3	1	-
Buttocks		5	25	7	2	5	3	1	2	-
Belly			1	8	4	7	2	-	-	2
Headless				2	-	2	-	-	-	-
Navel					-	3	-	-	-	-
Fingers						3	1	2	-	1
Head Adornment							10	1	1	-
Body Adornment								2	-	-
Pubic triangle									1	-
Beard										2

The 3 Bs: Bellies, Breasts and Buttocks

We have noted previously that there was a strong tendency for exaggerating the buttock and stomach regions seen in increasing numbers on female and non-gendered figurines. This attention to the buttocks and stomachs, to their careful delineation or pronouncement, was typically at the expense of other bodily characteristics such as limbs and sometimes breasts. Notably, a few



Figure 144: Figurines with exaggerated buttocks. Photo Figurine Team

abbreviated-human crossover examples also sported exaggerated buttocks and stomachs (Table 12), suggesting that the two 'traditions' of exaggeration and abbreviation were not

mutually exclusive, nor strictly divorced. While breasts were the trait most commonly depicted (59 occurrences), the stomach (39 occurrences) and buttocks (45 occurrences) received the most emphasis or exaggeration.

The combined emphasis on breasts, buttocks and stomachs has prompted many to interpret these figurines as pregnant or fertile women. However, as we have argued many of these features are depicted in such a way that is not suggestive of fertility, but of maturity (Meskell et al. 2007; see also Voigt 2007). Furthermore, while breasts and stomachs are secondary reproductive traits, buttocks are not. And intriguingly, the most common pairing of traits is bellies with buttocks, and breasts with buttocks (both 25; see Table II). Many cultures, including contemporary ones like our own, place enormous emphasis on the buttocks, bellies and breasts in social, sexual and aesthetic terms; the depiction of these features, therefore, does not necessarily signify reproduction and fertility. Other features that occur include fingers, body-markings or clothing, and hair or head adornments, and are traits that are non-reproductive but might articulate particular ideas of identity, sexuality or gender. It is also notable that, in these exaggerated cases, depiction of the genitalia is absent in almost all cases (only 4 examples depict pubic triangles and only 5 phallomorphs are currently known). For a more potent symbol of fertility/virility, one might turn to the small number of purely phallic examples that we have discussed previously (Meskell and Nakamura 2005; Nakamura and Meskell 2004). However, these are isolated phalluses of an idiosyncratic type rather than whole bodies, and they appear to be another clear example of the desire for abbreviation as well as a gestalt production of the male body.

The quantification of body traits and zones suggests that reproduction, pregnancy and fertility were not obvious or primary concerns of figurine makers and consumers and moves us towards the further consideration of the non-generative emphasis of the human figures across the site. There is a distinct emphasis on non-genital, non-reproductive traits, which underscores the torso as a focal zone. This attention takes various forms and often conveys a certain fluidity of the body and its boundaries.

Examples of figurines with markedly distended stomachs also gesture towards certain forms found by Mellaart in which the stomach or lower front extends outward into the head of an animal (see Ankara 79-457-65 and 79-161). Parallels can also be found for these figurines at Mezraa-Teleilat (Özdoğan 2003) and other Neolithic sites. These should not be confused with Mellaart's stone examples of men with leopards (Ankara 79-168-65, 79-162-65). The examples we point to here do not have clearly defined human and animal elements, but have rather amorphous bodies that defy the natural surfaces and boundaries of the body. These are not generally smoothed contours but rather roughly modelled surfaces.

We have also noted a concerted interest in the navel, marking it either as an indentation or an added detail. This can be seen across the site in figurines, stamp seals as well as the famous plastered wall figures with swelling, decorated stomachs (see Mellaart's 'Shrines' VI.B.8, VI.B.10, VII.31, VII.45). It should be said that we do not interpret this focus as a preoccupation with fertility or birth: there are no representations in the wall art of pregnant women, scenes of birth or infants, and with possibly only one or two representations that might be children. In a literal sense, the navel is an external, visual marker of the link between the living and the unborn.

Therefore, it may be connected to ideas of birthing as a cultural concern and the connection between generations that may extend beyond offspring to producing ancestors, both in a literal

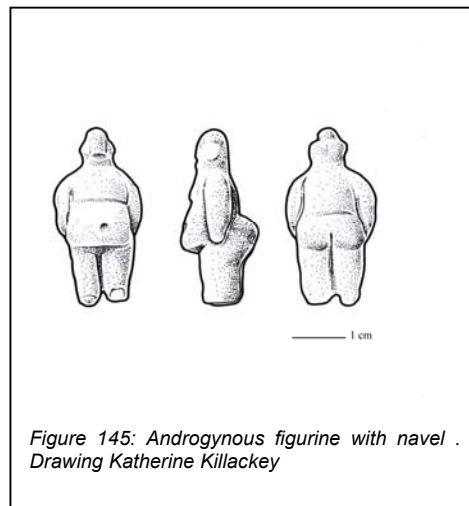


Figure 145: Androgynous figurine with navel .
Drawing Katherine Killackey

and symbolic sense. This idea might find some support in the occurrence of navels on androgynous bodies such as the splayed plastered wall figures and human figurines (Figure 145).

Furthermore, there is a seeming aversion to depicting children, adolescents, mothers with babies, and childbirth. The representational material in toto thus suggests a severely curtailed presentation of the lifecycle. As in other cultures, some aspects of the cycle may invite prohibition since they represent dangerous or liminal life experiences. A woman, with a baby still lodged in the birth canal, dug in 2006 under a platform in Building 60 in the 4040 Area. Her head was removed thus marking a rather specific bodily treatment. Whatever the meaning, it suggests a particular focus and attention on the pregnant form but in a concealed and hidden rather than public context.

In 2007 excavators uncovered a plastered splayed figure, probably of a bear, in the 4040 area during construction of the site shelter. Unusually, it was placed in the corner of a building with its legs astride the corner (see our Archive Report for 2007). It was carefully shaped and smoothed; the stomach was round and protruding with a pronounced navel. It was clear that the stomach was shaped and added later and plastered over to convey a smooth three-dimensionality. The presence of the navel on animal forms, especially animals like bears, presents us with a clear case of anthropomorphism or human/animal cross over. It is salient to note that while in theory all mammals (with the exception of monotremes) are born connected to the placenta by way of an umbilical cord, this does not leave the trace of a navel that is peculiar to human offspring. The mother cleans away the remains of the umbilicus and there is no visible mark. Moreover, unlike human bodies those of animals like cats and bears are covered with fur making any presence even more impossible to view. Just like the numerous bears anthropomorphized today in our own society (for both children and adults) there was a need to insert the navel to make the body legible and familiar for those viewing and comprehending the perhaps human like traits of the animal. While this example is intriguing it does also reinforce some of the issues we have identified for anthropomorphic figurines at the site. It highlights the significance of the stomach, particularly an exaggerated stomach, and underscores the importance of articulating the navel (see Table I). Like the figurines, such figures downplay the presence of genitalia or sexing the body. Similar to the many splayed plastered anthropomorphic examples Mellaart uncovered on building walls during the 1960s there is no suggestion of sexual attributes, however, the stomach is typically accentuated with added plastered elements and paint.

As demonstrated in Table I2 the depiction of breasts occurs in 59 examples across the corpus and most commonly correlates with a pronounced stomach and buttocks. Although the figures with both prominent breasts and stomachs are generally interpreted as pregnant females, such features are commonly depicted as flattened, drooping and angular rather than robust and rounded in shape, as one might expect of a healthy pregnant female. It is possibly that the more flattened, downward sloping stomachs and breasts might rather represent aging bodies. We might then suggest that the figurines of seated, weighty individuals are perhaps more reminiscent of geriatric, unsexed bodies rather than pregnant female bodies. Many of the examples we find emphasize the navel, belly and buttocks with either absent or small breasts.

Often the breasts are not portrayed symmetrically and appear to be somewhat flattened and pendulous. Similarly, stomachs, while exaggerated are not evocative of pregnancy, but rather of maturity or even obesity. In this way, many are suggestive of aging bodies rather than young and reproductive types, as indicated above. Oddly there is little attention to any shape that might suggest a young or adolescent body type, which would tend to be a focus in other cultural repertoires such as in Egypt, the Mediterranean, and the Mayan culture. We have only one example that (13129.X1), a somewhat more slender piece without a head, hands placed on a protruding stomach, with traces of red paint on the surface. Generally human females are rare in both the wall paintings and the plastered forms. The majority of the human images in wall paintings are, of course, male and the plastered anthropomorphic examples are androgynous and some of those may have been zoomorphic, as in the case of the 'bear'.

There are no clear indications that the robust, fleshy figurine body types were found in the actual human population. Preliminary analyses of the mortuary data do not demonstrate any evidence of obesity in the general male or female populations. For instance, the human remains team has found no evidence of DISH (Diffuse Idiopathic Skeletal Hyperostosis) that may be associated with obesity. It is an ossifying condition that produces amylosis of the spine due to ligament ossification and rarely observed in individuals younger than 40 years old (Aufderheide and Rodriguez-Martin 1998: 97-8). We might also expect to find osteoarthritis in the knees and toes suggesting the body has had to carry undue stress due to excessive body weight, but this has not yet been identified. However, given the distinct renderings of flesh seen on some of the robust figurines, some have suggested that these images were not purely imagined or idealized, but likely based on first-hand experience. Jessica Pearson has noted that certain exceptional burial contexts suggest the possibility that one or more obese individuals were present in the community, and she has proposed a project that would address this proposition through both quantitative and qualitative analyses of certain burials and human remains. From the current known data, however, the exaggerated figurine forms at Çatalhöyük, which we would assert are not rigidly gendered in every case (and thus not always female), were not drawn from daily life scenarios, as borne out in the wall paintings. Rather, they portray extreme examples of the fleshing and re-fleshing of bodies and skulls that we witness across the site and most poignantly within burials.

Given that almost all Çatalhöyük figurines appear to be eventually discarded or 'recycled', and the de-emphasis on depicting primary sex traits, we suggest that these exaggerated figurine forms articulate a more abstract notion of abundance and maturity that was not necessarily tied to ideas of female or male status. Images of mature bodies are suggestive of longevity, health, achievement and elder status in short, the knowledge and experience required to be a respected, productive group member that ensures the survival and success of the larger group. With the figurine forms, flesh and excess might signify a concern and desire for social success that looks towards the future and also draws from the past. As such they are images of abundance, duration and success.

Abbreviated Bodies

On the other end of the figural spectrum, Catalhoyuk also produces many 'abbreviated' forms that range from about 1 to 5cm in height and generally delineate a head and torso on a formed base (divided and undivided). The head is commonly formed by a pinched action that creates a large nose or beak and trunk is often elongated and curved forward, giving the impression that the figure is seated. Many of the figurines are free-standing on bases that are sometimes divided to suggest limbs, feet or, perhaps in the more phallic examples, testicles (Figure 146). They indicate a certain rapidity in making and their ubiquity suggests that such practices could have occurred regularly, perhaps even on a daily basis. These enigmatic figures have elicited prior identifications as diverse as 'bird-men', miniature phalloi, and 'humanoids'. Such ambiguity may suggest a potential blurring between categories of human and animal, in the case of 'bird-men', or whole and part, in the case of anthropomorphized phalloi with human heads and 'feet'.

Given the ambiguous and generic nature of these forms, we suggest that the inscription of specific meanings around them were possibly quite fluid and/or multiple. For instance, they articulate the most basic notion of a body as a head, torso or shaft, and base, and with subtle gestures can be made to be more suggestive of a human, animal or phallic form (Figure 144). Furthermore, the three-dimensional form of figurines aids such multiplicity. In handling and turning such figurines and viewing them from different perspective, many take on different aspects. Many abbreviated figurines, when viewed from above or from the side, give an overall visual mpression of male genitalia; and Mehmet Özdoğan (2003) has argued that similar abbreviated forms from Mezraa-Teleilat represent phallic forms. This is certainly one possible interpretation for the Çatalhöyük materials as well. However, we would also emphasize that visual play, which enabled multiple engagements and values, may have been intentionally or unconsciously created. Just as bodies and persons at Çatalhöyük must have had multiple roles and valences, so did these abbreviated figurines.

Although somewhat generic, abbreviated figurines do seem to articulate a set of specific concerns. This form, which likely sought to capture the most general qualities of a generic body its capabilities as a semi-autonomous, self-contained 'living' organism in a miniature, still- life form, was occasionally embellished. Out of 237 intact, diagnostic abbreviated figurines, 38 of the 49 more 'elaborated' forms focused on the head (Table 12). Most commonly this took the form of a folded head element. This element has commonly been interpreted as a headscarf or hair (Hamilton 2006), two features that are associated with humans rather than animals. The figures with pointed heads, which are less common, are more evocative of a bird or animal. Moreover, many of the figurines are self-standing and almost all assume a slightly hunched over body position that gives the impression of a seated body. From the human remains we know that the residents of Çatalhöyük squatted or sat directly on the ground, whenever at rest or to undertake particular tasks: various postures identified in the skeletal record include squatting on the heels, squatting or kneeling on toes, sitting cross legged, squatting both legs to one side, squatting knees together heels to buttocks, squatting weight on one foot purchase on the other (Molleson et al. 2005). In sum, the qualities of these abbreviated figurines along with their small size, would invite people to engage the figurines in particular ways; abbreviated figurines could be set up on floors and surface and also carried around or circulated. Regardless of their specific values and meanings, we surmise that the social worlds of such objects constituted very fluid and familiar practices at Çatalhöyük.

Body Kinds, Body Politics

How might archaeologists situate such varied figurine work within a broader body politic at Çatalhöyük Specifically, we have interrogated what sets of concerns emerge in the examination and correlation of certain standardly exaggerated and attenuated body parts and body-types. Body images that are commonplace, much like some of the Çatalhöyük figurine forms (Figure 144), seem to concretize a process of articulating subjective bodily experience with cultural knowledge and concerns. Such body kinds likely do not represent particular individuals, especially in light of their disposability. It is worth stressing that irrespective of materials employed, whether clay or stone, figurines at Çatalhöyük were treated and disposed of in the same ways (Meskell et al 2008: 143-4). It is not simply a matter of saying that clay examples are crude whereas stone examples are more expertly manufactured and



Figure 146: Range of Abbreviated Forms

demonstrate more detail. Examples in clay and stone can equally highlight or downplay bodily and sexed specificity. Certainly, such figurines may have been used as agents in storytelling, play or instruction, and many have additional or non-standardized details that evoke a quality of 'uniqueness.' However, many of these figurines also strongly evoke a 'body-kind'. Çatalhöyük figurines depict two general body-kinds: exaggerated anthropomorphic bodies that focus on the torso and its features such as stomachs, breasts and buttocks, and abbreviated, sharpened three-dimensional silhouettes of a head and torso.

Flesh and Bone

For the anthropomorphic examples, it is helpful to look at the Çatalhöyük body practices across different media including wall art, figural plaster features and human burials. One observable difference, perhaps somewhat dictated by the constraints of media, is that the human figures on wall art are rendered much more dynamically. Humans often appear in motion, with an emphasis on limbs indicating different activities such as dancing or hunting, whereas the figurine and plastered features are much more static and compact. Additionally, when one considers the three-dimensional representations (figurines, human remains and plastered objects), it is possible to argue that these practices articulate a tension between fleshed and skeletal bodies, which are mediated by practices such as plastering bucrania, human skulls and figurine production (Meskell et al. 2008). Perhaps the most dramatic example of this tension occurs in a single object: a headless figurine (12401.X7) that depicts an articulated skeleton on the back and a typically robust female with large breasts and stomach on the front. While this figurine is evocative of the duality of life and death, it can also be seen in terms of the more literal duality of flesh and bone and their attendant, complex associations with life, survival and vitality.

The realms of life and death were not clearly separated at Çatalhöyük. The tradition of burying people under platforms in houses meant that at least some people confronted various levels of death and decay throughout their lives. Burials frequently cut into and disturbed previous interments and people took these opportunities to remove certain body parts from older burials while the skeletons were still partially fleshed (Molleson et al. 2005). Villagers carried out such acts with a precision that suggests that they had significant anatomical knowledge of the human body and its decomposition, and they must have been intimately familiar with the dual processes of fleshy decay and skeletal durability. They often retrieved and perhaps circulated human skulls and plastered and reburied at least one. Additionally, they often plastered certain types of animal bones, primarily bucrania, skulls and claws and installed them as features in rooms. Given the qualities of plaster that it protects, transforms and fortifies an underlying substructure it is tempting to view the practice of plastering in terms of maintaining, building up, and indeed 'enfleshing' domestic/ritual objects and spaces in order to make them more durable, robust and efficacious (Meskell 2008). Clays and plasters likely had particular associations with flesh and bone. The preoccupation for plastering surfaces and objects then might have articulated a particular concern for making things and spaces more durable and lasting, for linking generations, and materializing a connection between the past with the present.

Extending this idea a bit further, it becomes possible to view the emphasis of breasts, stomachs and buttocks outside of the standard gendered frameworks that often invoke female fertility and/or status. As we have noted elsewhere (Nakamura and Meskell 2006), many of the robust figurine physiques seem to evoke mature (post-reproductive) and not necessarily female bodies. The exaggerated features are focused on the torso the breasts, stomach and buttocks and are the only potentially conspicuous bodily features made purely of flesh. While the skeletal structure supports the forms of limbs and the head, the forms of breasts, stomachs and buttocks emerge from bodily soft tissues. The prominence of such features cannot only suggest fertility or abundance, but can also indicate longevity and survival. Mary Voigt (2007) has addressed this issue in her work with some 76 clay and stone figurines from Level VI at Haçilar now dated to c. 6000 BC. Although somewhat later in date than many of the figurines we are analyzing, her ideas on the materialization of the aging body are noteworthy. In the illustrated examples such as those shown in Voigt's Figure 12.4 (Mellaart's figurine 490 and 589) a clear attention is paid to the buttocks at the expense of the front of the torso and the arms. The pubic region seems of little consequence while elongating and accentuating the buttocks takes on unnatural proportions. Other famous examples such as 531 show exaggerated and pendulous breasts, but more typically the Haçilar figurines draw

the eye to drooping stomachs and accentuated buttocks (e.g. 531, 487, 505, 507, 520, 529, 486). While these are a generally more elaborate type than those uncovered at Çatalhöyük, one can determine threads of commonality in the materialization of the body. Voigt suggests that the lifecycle or life course of women can be traced through the figurine corpus, from young girls with small breasts and narrow hips to mature women with 'enlarged upper arms, medium to large breasts, pendulous stomachs, and huge hips and buttocks' (Voigt 2007: 165). She surmises that these robust evocations represent bodies worn by work and childbirth. Another aspect she underlines is their sexuality, specifically a mature sexuality that was largely obscured by Mellaart in favor of emphasizing childbirth and maternity. Overall she identifies these particular embodied representations as ordinary women that served as models for adult roles within the society (Voigt 2007: 168), and she extends this interpretation to those examples found at Çatalhöyük that she also sees as linked to initiation practices.

However, in light of the particular practices seen at Çatalhöyük, we can also offer a different interpretation of such physiques. At a basic level, mature bodies evoke ideas of survival and longevity and their associated value in society. Furthermore, the idea of a mature female sexuality seems more compelling than narratives of female fertility given the lack of representation of genitalia (primary sexual or reproductive traits) or childbirth on female figurines at Çatalhöyük. Other representational scenes at the site also generally do not depict scenes of childbirth or maternity. The features emphasized on the figurines breasts, bellies, and buttocks are secondary reproductive traits and are not only associated with reproduction, but also commonly inscribed with social views on sexuality, health and status. The strikingly lack of emphasis on explicit sex traits on figurines and the transposability of certain features such as navels, bellies, and buttocks across various media and body kinds suggests that these body parts and zones addressed concerns that moved across rigid boundaries of male and female, human and animal, and the living and dead.

In summary, we have turned to materializations of the human body itself in order to gain further insight into the worlds they inhabited and embodied. Instead of starting from a position of interpreting a handful of evocative objects from their visual properties alone we chose to quantify those physical traits present for the entire corpus of anthropomorphic and abbreviated figurines. The results of our study underline an emphasis on the 3Bs (breasts, bellies and bottoms) of the human form and a concomitant disinterest in the detailing of genitalia in the vast majority of cases. There are only a couple of exceptions that detail the pubic area and a handful of free-standing phallic figurines. The exaggerated and often sensuous rendering of buttocks, thighs and stomachs might draw our attention toward a mature sexuality that potentially cross cuts gender lines. Sexual characteristics or erogenous zones need not simply encompass genitalia per se. These are the physical characteristics or qualities of idealized bodies or body kinds that figurine makers chose to accentuate over some 1400 years of the site's occupation. Another interpretation is that the depiction of fleshy stomachs and buttocks were material signs of longevity, good health, access to food, sedentary lifestyles, signs of indulgence and the ability to give. The explicit roundness of numerous figurines' demonstrates the success of a way of life in producing a wealth of goods. It is the ideal visual metaphor for abundance' (HarrĀ 1991: 68). The evidence from other data sources at the site including burials, human remains and dietary analysis demonstrates that this was an idealized rather than lived reality for the majority of people at Çatalhöyük. Set against the fragility of life and the fragility of flesh, many figurines could have embodied success and maturity through an idiom of rotund, sturdy forms. As argued elsewhere, fleshing out human and animal remains with plaster, molding fleshy human and animal bodies on house walls and creating exaggerated human figurines were all testaments to ongoing efforts to maintain lifelike, robust and dynamic materializations.

The other 'body kind' popular at the site is the abbreviated form that might in some instances also blur the boundary between anthropomorphic and zoomorphic representations. These are much more common than the strictly anthropomorphic types but have received little scholarly attention. We suggest that they present a generic bodily form, sometimes with a phallic inflection, at other times hinting at a seated body, and typically retaining a fluid and multivalent character. The particular qualities of these abbreviated figurines along with their small size, may have invited people to engage the figurines in particular ways. Because they are free standing they could have been set up on floors and surface yet also carried around or

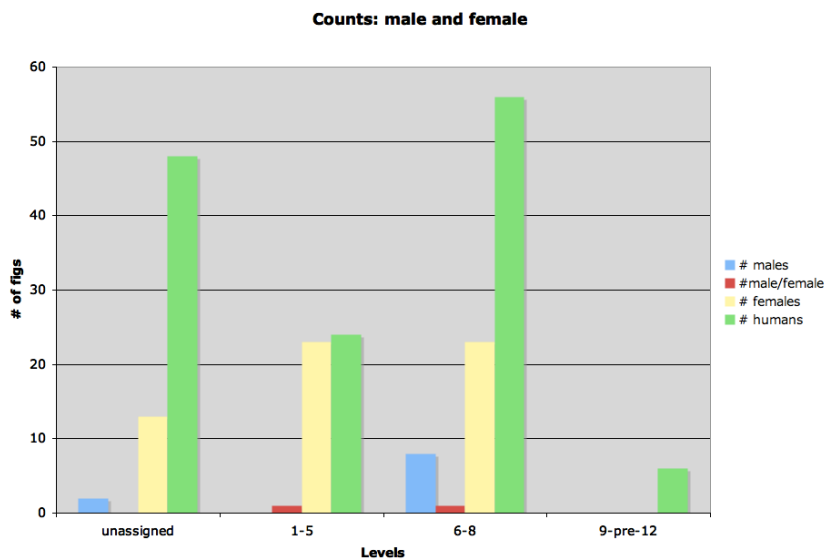
circulated. Irrespective of their specific values and meanings that we can only speculate that the social lives of these objects constituted both fluid and familiar practices across the site.

Notes on other Patterning

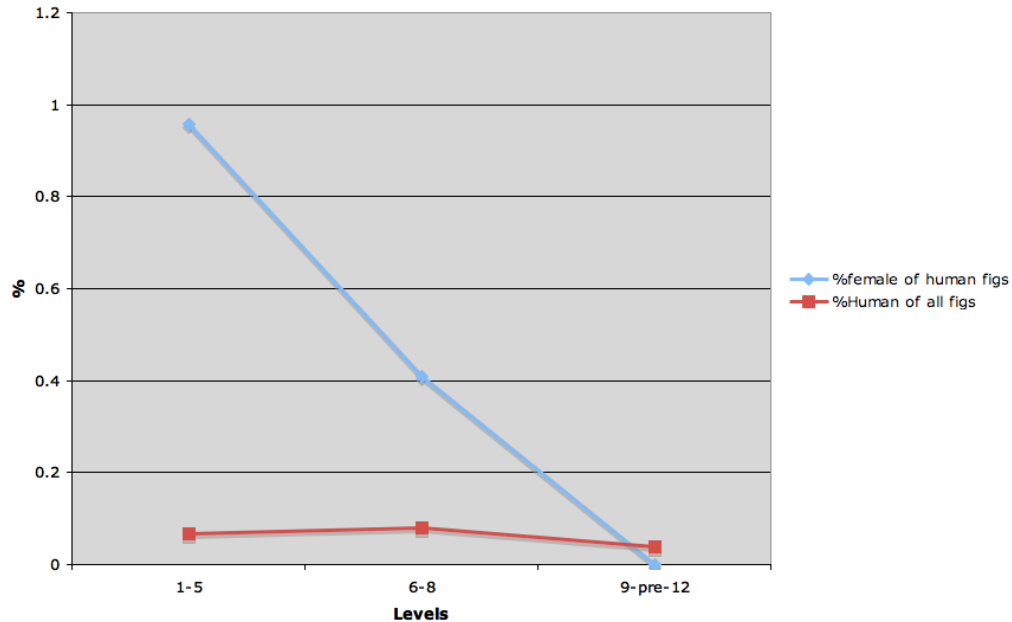
Several other trends have become apparent this season. The first is that almost all the headless figurines with dowel holes for detachable heads are of a female type with marked breasts, bellies and often buttocks. There are no male examples, but a handful of androgynous forms. We also are seeing anecdotal patterns in figurines deposition with the more clearly human and often female examples being excavated from the South Area rather than the 4040. We also believe that more stone examples come from the South Area and there has been some discussion amongst the excavators that this could represent a stone working area. Whatever the case we are possibly defining differences between the two areas of the site in regard to figurine types and deposition.

This season in part because of the involvement of scholars from the Templeton project we were asked to investigate possible gendered patterning of figurine production and deposition through time and according to level. The notion of some dramatic change around Levels VI-V has developed following Mellaart's assertions and designations, even though we know much of his data to be unreliable. Discernable changes in other domains whether faunal, lithic or ceramic materials may or may not be paralleled by the figurines, but we should not assume a priori shift in all aspects of the site. If we were to focus exclusively on excavated figural material from our own project, any discernable patterns would be rather weak. However, if we begin with Mellaart's materials and accepting his level designations (as others have done previously) one could argue that many of the male figurines in stone derive from Levels VII and VIII and then large, seated females start in Levels VI-V and occur predominantly in the upper levels of the site. Given the small numbers of examples, the highly idiosyncratic nature of some examples and the very fact that Mellaart's uncontexted finds have been identified as a problem in all areas of the project, we feel that such patterning should be considered highly speculative. What we can say with more certainty, however, is that there is an increase in representations of the human form from Level VIII onwards and this does rely on the current excavations materials. One other caveat should be mentioned. While vast midden deposits were dug for the early levels of the site in the South Area, there are relatively few buildings dug before Level X and also very few at Levels II and I. Much of the work of this project might be clustered around Levels IV-VII.

The above are charts generated to show changes in gendered patterns in figurine types through time. All rely heavily on Mellaart's findings.



Percentages: Comparison of Female-to-Human figs and Human-to-All figs



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Clay Stamp Archive Report 2008 - Julie Cassidy

Çatalhöyük Research Project

Abstract

The following is a report on the clay stamps found during the 2006, 2007 and 2008 seasons at Çatalhöyük, and a brief discussion about their interpretation and possible further research avenues.

6 stamps were found in 2006 (one of which is not specifically a stamp but deserves a special mention within this report), only 1 was found in 2007 and 3 stamps of high quality were recovered in 2008. Interestingly, with the exception of the IST area 2008 stamp, all were found in midden or room fill deposits.

This report offers a description of all the stamps plus a brief discussion on their use and meaning, using Ali Umut Türkcan's 2005 publication of the Mellaart stamps as a reference point.

Introduction

Firstly, the traditional use of the term "stamp seal" in connection with these objects should be challenged. Stamp "seal" is a term deriving from the practice of using a seal to stamp ones identity onto documents and goods, particularly in Roman and Medieval contexts, where a wax seal was used by traders and people of high office to prevent forgery and fraud. When used in a Neolithic context, the term is something of a misnomer. Therefore in this report, and in the Çatalhöyük database, these objects will be referred to simply as Stamps.

The following are reported on by year of recovery.

2006

13360.X3. South Area. (ET149)

Found in room fill within Space 299 of Building 65, South Area

Dimensions: 40mm x 32mm x 16mm.
Medium fired. Lug missing. 75% of face present.

Face is mostly flat, but appears well worn, particularly in the centre, suggesting heavy use. Circular with a central criss-cross pattern, continued towards the edge of the piece by concentric right angles lines.

Similar to Stamp No. 25, found by Mellaart in 1961, which unfortunately has unknown provenance (Türkcan, 2005), and also to a stamp (8892.X1) recovered in 2004 from a midden in the 4040 area (Türkcan, 2004).

13522.X26. TP Area. (ET1)

Found in midden.

Dimensions: 27mm x 22mm x 5mm.

Black well-fired clay. Fragment. Partial edge present, its shape and so far unique design



suggests its use as a stamp. Flat face. Deep incisions imply it was not used frequently. 'Eye' motif. Sharp elliptical shape apparently following the edge of the piece. Two vertical lines to the right of the corner, with a spiral in the centre. Broken across the central spiral.

13522.X4. TP Area. (Envanter No.7).
Found in midden.

Dimensions: 25mm x 12mm x 20mm
Lightly fired mid-grey clay. Oval face. Scroll-like design. Opposing scrolls with a hole close to the edge, filling in the gap between the start of the stem of the scroll and the head.

12980. 4040 Area. (ET147)



Upper layer of midden in Space 279

Dimensions: 40mm x 40mm x 30mm

Black medium fired clay. Conical shaped lug is complete but roughly formed. Appears to be a 6 pronged star motif, although two of the prongs are missing. Prongs are blunt and not precisely situated around the central area. Deep circle incised into the centre. Central section is flat but prongs slope back slightly suggesting heavy use and wear.

12980.H7. 4040 Area. (ET210)
Upper layer of midden in Space 279
Dimensions: 40mm x 30mm x 28mm
Black hard fired clay. Less than 25% present.

Thick, rounded edge and flat base. No lug. 9 horizontal incisions heading towards what was probably a central groove.

This object is unlikely to be a stamp, but deserves a mention here due to its status as an incised clay object found in relation to several figurines and the previously discussed stamp. A similar object found by Mellaart in 1962 was discussed by Türkcan (2005) (Stamp No.1). The form seems similar to certain shaft straightness or burnishing tools, but the clay fabric prevents them successfully functioning as such.



12902.X1. 4040 Area. (ET148)

Found in ashy roomfill of Space 276 of Building 59.

Dimensions: 22mm x 24mm x 14mm
Approximately 45% present.

Pale grey clay. Hard fired. Oval face. Lug missing. Broken vertically across mid-section. Zig-zag design created by 2 concentric triangles with alternate diagonal lines and a hole filling in the gap created by the smallest triangle. Rounded at the edges suggesting heavy use.



2007

15828.X2. TP Area. (ET20)

Found in midden layer in western area of Building 73.

Dimensions: 40mm x 35mm x 28mm
Well fired. Dark grey clay. Flat face. Base of stamp sweeps upwards to create the lug, which is partially present. Small fragment of edge remaining suggests an overall oval shape. Some signs of use but not well worn.

Stamp is typical of a pseudo-meander design, as seen in several of Mellaart's recovered examples (Türkcan, 2005). The square gaps created by a series of interlocking horizontal lines and right-angled corners are filled by round holes.

2008

13918.X1. IST Area. (Envanter No. 13)

Found after had fallen from east section of IST area, and so no true context can be assigned.

Dimensions: 57mm x 27mm x 27mm

Well fired. Mid-grey clay. It is almost complete apart from two small sections at the top part of the stamp and a small chip from the lower edge. Uneven clay marks around the base of the lug suggest that the lug was attached to the back as a separate action. The design is so far unique to the Çatalhöyük collection.



When held vertically, the stamp is strongly suggestive of a horse's head, when view face-on. The "ears" at each side of the mane, are chipped. The "eyes" are half way down each side, and the "mouth" is represented by the slightly chipped, curved incision at the base of the piece.

17047.X1. South. (Envanter No. 10)

Found in midden deposit in Space 339.

Dimensions: 30mm x 33mm x 8mm
Well fired. Fabric for the most part is a reddish colour, with some blackened patches to the lower part and back, suggesting contact with heat.

Hand motif. The lug is missing and the fingers are damaged. There is a spiral at the centre of the palm. Around the edge of the hand and up along the fingers is a wavy line with small



triangles filling in the gaps created by the crests of the wave.

A similar stamp was found by Mellaart in 1962 in the area he called Shrine E.I, Level IV (Türkcan, 2005). In this example it appears that only 3 fingers survived with any detail.

17697.X3. TP Area. (Envanter 19).

Found in midden below the western part of Space 325 in Building 74.



Figure 154: 17697.X3.

Dimensions: 31mm x 12mm x 23mm

Well fired. Complete with a pronounced triangular lug. This stamp is identical to 13522.X4 other than this piece has triangles filling in the gap between the scroll head and the stem, rather than the circular holes.

Interpretation

Interestingly, all the stamps from the last three years, with the exception of 13918.X1 for which we have no secure provenance, have been found in midden or room fill. This is also true for the stamps found in 2005 (discussed by Türkcan in that years Archive Report). This is in conflict with previous assertions that stamps frequently occur in burial contexts. A preliminary review of the excavator's unit sheets for the contexts associated with these stamps suggests that they were found in burnt or ashy layers, possibly associated with activity related to the closing down of the building or development of the midden.

However, this is not exclusively the case, and some stamps from previous seasons were indeed recovered from burial contexts. The discovery of an artefact in a burial context suggests that the artefact had an acute personal meaning to the person in the grave, and also to the family responsible for the organisation of the burial. In *The Leopard's Tale*, Hodder suggested that items of personal identity or status are given priority over items of domestic production within grave contexts. It is therefore interesting that an artefact such as a clay stamp should be given such a high level of status. Depending on how we interpret the function of the stamps, it would be reasonable to suggest that the end product, i.e., the cloth decorated with the design of the stamp, would have been included within the grave, or the body stamped with a design, rather than the stamp itself being given meaning as an object of importance in its own right.

There is a conflict of meaning between those stamps given high importance as burial goods and those stamps found in middens which appear to have been disposed of with the ashy, burnt room fill. Future research into the contexts in which these stamps is required before we can attempt to understand their meaning and importance within society.

Often, the motifs appearing on the stamps can be seen on other visual media across the site. The bear stamp (11652.X1), for example, is very similar to the wall reliefs first



Figure 155: Incised decoration on a wall in the TP Area

interpreted as Mother Goddesses by Mellaart and reinterpreted as bears by the current team (See Çatalhöyük Archive Report 2007). The scroll design seen on stamps 17697.X3 and 13522.X4 from the TP area are very similar to the repetitive scroll designs seen on the wall relief uncovered in the burial chamber of that area in 2007 (Figure 155). Similarly, the hand motif seen on stamp 17047.X1 has been seen in wall paintings across the site (Figure 156).



Figure 156: Painted wall. B.55, 4040 Area. Hand motifs towards the left with a geometric design to the right.

Therefore, it seems that the iconography found within houses, which would have been private and visible only to the people within that house, is copied into a more mobile, public format. If Mellaart and Türkcan's assertion that stamps occur mostly in the later phases of the site is correct, then does this suggest that the need to publicly portray one's family or household identity increases over time? Is one particular design closely associated with one family or clan? This change would symbolise not only a change in material culture but also the onset of a need to assert one's identity in the public sphere.

Despite the reproduction of stamp designs in other media, we have no direct evidence regarding the use of the stamps themselves. It seems likely that stamps had a variety of different functions, i.e., some may have been used to decorate skin, leather or textile, while some may have been designed to create impression in clay or plaster. The faces of many of the stamps are not completely flat, suggesting that the surface to be decorated is also not flat. It would be difficult to stamp cloth with an uneven stamp face. However, this does not automatically indicate that they were used on skin. The bear stamp found in 2005 had a protruding belly button. The only possible use for this stamp is to impress the design into something, such as plaster or clay.

However, the interpretation of stamps used to impress a design encounters problems when we realise that neither Mellaart or Hodder's excavations have produced an impression of a stamp. The frequency of the stamps and of clay objects and building material would suggest that if the stamps were routinely used to make impressions around the house, then at least one would have come to light by this stage.

Proving their use as tools to imprint cloth is also problematic when we consider that no textile on site is preserved. There are also no obvious signs of pigment on the surface of the stamps when they are found. If vegetable dyes were used, rather than the mineral pigments such as ochre, then all traces of this would decay quickly.

There appears to be a noticeable variation in the quality of the stamps. The bear, horse and hand, for example, are finished to a high standard. Others, such as (12980) and 11858.X2, appear to be more roughly made and less well baked. Does this suggest that some stamps are made by skilled artisans for a particular use, and others are being roughly made by people for their own use? i.e., cloth making industry on a large scale for barter and trade, versus someone decorating their own clothes. Did Çatalhöyük have this kind of societal division? Rich vs. poor? Industry and trade vs. individual craft? However, it is also true that the simpler, smaller geometric stamps show more signs of heavy use than the more elaborate examples. This apparent difference in quality may well be attributed to less use. It is logical to assume that the geometric designs are used repeatedly while the more unique designs are used only occasionally.

Recommended Further Research

It is clear that much more work needs to be done regarding the interpretation of context and use of the stamps found at Çatalhöyük. As discussed above, research into the contexts in which the stamps are found may reveal some information about their use. Similarly, a study into the types of clay, firing quality and manufacture methodology would help us to understand wear patterns seen on many of the stamps. Does a stamp need to be in use for many years to show the signs of wear seen on the stamps?

Although it is unlikely that vegetable dyes have survived, residue analysis on some of the stamps may have retained some traces of dyes. Residue analysis on some of the better preserved stamps may reveal the type of dyes, if any, used.

Ethnographic studies would offer variations in interpretation of use. How many other cultures use a specially produced clay stamp to paint their bodies rather than applying paint directly onto the skin? Do stamps used for painting the skin differ in size or form to those used to stamp designs of furniture or cloth? Equally, research into the material culture of other sites of a similar period in the Anatolian region would determine whether certain designs are typical to the region and time, or whether they are unique to Çatalhöyük.

Collaboration with pigment, wall painting, plaster and figurine specialists may produce ideas about how the stamps would have been used and whether any of the designs or motifs on the stamps are reproduced through other material culture on site.

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Clay Ball Research, statement - Sonya Atalay

Indiana State University

In the 2008 field season research on the clay balls continued with a team of two – myself and one lab assistant, Ted Mendoza. Several undergraduate students from Stanford University were also trained in clay ball analysis during the 4 week field season.

Our team was able to reach the goal of full recording of all clay balls from 2006-2008. In addition, we were able to complete phase 1 level of recording of all clay ball material excavated since the last study seasons took place (including years 2003-2008). Much of this material was recorded fully to the phase 2 level.

What remains is for this dataset to be analyzed and compared with clay balls materials from earlier levels to understand the change in production and use over time at Çatalhöyük.



Figure 157: A typical clay ball assemblage. Photo Clay Ball Team

This research will be carried out over the next three years of study seasons.

2008 Clay Building Materials - Mirjana Stevanovic

Stanford University

The Aims of the research

Current analysis of the Çatalhöyük architecture aims to provide a more refined understanding of the existing variability of houses, their changing nature, and the associated material and social practices. It is likely that the variation visible in the Çatalhöyük houses indicates the presence of social differentiation, which has long been situated in the Near East (Hodder, pers. com.). An objective of this research is to explore whether any substantial variability in houses could also be demonstrated in house construction, in the materials used for construction, and in the construction techniques.

It is likely that the long term existence of certain houses, their larger size, and more elaborate interiors would have employed a larger diversity of building techniques and materials than would other structures. There are indications that at Çatalhöyük in addition to the use of 'standard' building materials and techniques, such as pre-manufactured sun-dried mud-brick, mortar, and plaster, other techniques, such as wattle-and-daub and hand-shaped, plastered bricks occur in certain houses. The wattle-and-daub technique as well as smaller size atypically shaped bricks seem to occur in houses that also contained large assemblages of artefacts that might be interpreted as of a symbolic nature. It is believed that a study of the context and spatial distribution of these attributes of houses at Çatalhöyük will facilitate our understanding of the distinction between 'domestic' and 'history' houses and the material and social practices that created them.

Early excavation of Çatalhöyük houses interpreted the architecture based on the most obvious building material found in houses, the sundried mudbrick. Ethnography of the local and regional houses served as the model in the interpretation of archaeological finds. Consequentially, Çatalhöyük houses were described as one-story rectilinear structures built of sundried mudbrick and mortar, with flat roofs. In these accounts, the use of less visible construction materials such as wood in wattle-and-daub or variety of small size wood needed in the roof construction, fibers that secured the joints, plants mixed as binders with mud-brick clay, and atypical bricks was either glossed over or was completely ignored. On the other hand, in our analysis of Çatalhöyük architecture we seek to identify the variety of construction materials and we assign equal importance to the broad range of building materials and techniques. Our data description, sampling and analyses including their quantification cover the entire range.

The work performed in 2008

During the 2008 season I concentrated on analysis and sampling of the building materials excavated from 1996 to 2007 with the objective of:

- (i) reviewing the occurrence of wattle-and-daub
- (ii) sampling bricks from the excavated buildings for macro-botanical identification
- (iii) and reviewing building materials for traces of burning in house fires

Occurrence of wattle-and-daub

At Çatalhöyük, wood as building material has been detected in case of interior posts that are regular features in the houses of this settlement. However, due to the lack of preserved house roofs the presence of roof-beams has been implied but was not backed by evidence. Until now, the rarely mentioned wattle-and-daub construction was associated with the earliest houses in the settlement and believed to be non-existent in the later periods.

The current excavation shows that daub occurs across the site. Often it is found in secondary context and in very eroded conditions. However, in some buildings it is well preserved, present in the primary context, in much larger quantities, and in a variety of sizes and forms. In the case of Building 3 this technique served for the construction of its screen wall and one oven/hearth superstructure. In Space 89 it was found in association with the installation that comprised of bull horns, human skull, and a flint dagger with bone handle in shape of wild boar. In Buildings 52 and 77 massive quantities of wattle-and-daub were uncovered. These

are remains of their respective roofs, possibly upper stories, and interior installations. It is significant that in the case of the two houses these construction materials correlate with occurrence of a) atypical hand-shaped and plastered bricks, b) with rich symbolic elaboration in the houses, c) and with partial but heavy firing of the buildings. The construction remains from Building 77 (excavated this season) remain to be studied in detail in 2009 season.

Since daub preserves the traces of its underlying wood structure it can reflect the use of variety of wood from large timbers to very fine arch and wall-panel structures, such as screen walls, as well as installations featuring bull-horns. A sizeable presence of timber may also indicate a difference in the status of buildings, since the procurement of timber implies a large labour investment (Asouti 2005).

Macro-botanical identification of the building materials

The macro-botanical identification was conducted by the Archeobotanical team at Çatalhöyük (headed by Dr Amy Bogaard and Dr Mike Charles), and by Philippa Ryan who examined phytolith remains (see their 2008 Archive Report). Burnt bricks, which had visible impressions of plants in the form of silica skeletons of plants that have decayed insitu were selected. The phytoliths often retain morphological shape of plants and can provide evidence about the use of plants as brick temper (ibid).

A number of samples were analyzed and additional samples of bricks were selected from Building 77 for analysis during the 2009 field season. The above mentioned researches found a considerable variability in amounts of plant material present in burnt bricks ranging from little or no plant material to an abundance of visible phytoliths. Some appear to be chaff and/or thin monocot stems and others are thicker monocot stems. Their initial results show the use of cereal chaff and leaves/stems from wetland plants in brick temper. It is interesting that, so far, there has been no evidence for the use of cereal stems (ibid). At Çatalhöyük the abundant quantities of the plants suggest their extensive collection and potentially the storage of these materials for their use in house construction (Stevanovic, forthcoming).

The review of burnt building materials

House burning occurs frequently at Çatalhöyük but its causes and the mechanism by which houses get only partially burned are not apparent. Also, the ability of the residents to control the fire so that only some portions of a house or a single house in the compound gets consumed in the flames could be implicated but it is not well understood (Twiss, Bogaard, et al 2008). Therefore, house fires represent an important avenue of research at Çatalhöyük.

During this season, while reviewing the samples for their timber impressions I observed the patterns of burning that occur on them. In addition, the samples of bricks that had undergone burning were also entered in the building materials database. I have recorded the attributes of these building materials that were transformed in house fires. Such is colour of clay after burning, impressions of organic materials that were imbedded in the clay but partially or completely consumed by fire, intensity of firing visible in the level of transformation of clay minerals, and the firing conditions indicated by nuances of red or black colour of the clay.

Also, burning of houses or parts of houses at Çatalhöyük is crucial for the preservation of the building materials that carry the wood and plant imprints. In such circumstances much information on timber (their size, type, ways of modification) get preserved. They allow us to measure and record the timber as well as the clay content that adhered to it. Notably, the same remains can be used for the investigation of the fire conditions and intensity, which are necessary precondition for understanding the causes for this practice.

Conclusions

The careful excavation undertaken by the current Çatalhöyük Project enables us to see much more variety in the choice and handling of building materials. Variety in building techniques is reflected in the use of brick and mortar for house walls and wattle-and-daub for house roofs, screen walls oven/hearth superstructures, and diverse installations. In addition, brick size, shape and constitutive material show significant variability. Tree trunks were complete if used for major house posts; they were split in half or in smaller plank-like timber when used in the roof construction. In some cases tree bark was removed before making it into timber, where

as in other instances tree bark was left in place. Wood posts and beams were mostly recycled from an old and abandoned house to a newly built house but in some instances massive timbers were allowed to be consumed in house fires. Secondary, smaller pieces of wood were extensively used in construction, as were reeds, grasses and probably leaves of various plants.

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Çatalhöyük 2008 Chipped Stone Report - Tristan Carter (1), Marina Milić (2), Nurcan Kayacan (3) (with contributions from Nejla Kurt (4)), Sonia Ostaptchouk (5) Brandi Lee MacDonald (6).

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Introduction

This report offers some preliminary discussion upon the chipped stone from the 2008 excavations of the 4040 and South excavation areas on Çatalhöyük East (the 'East Mound'), together with the first detailed assessment of the material from the new research on Çatalhöyük West (the 'West Mound'). We also detail a continuation of our non-obsidian chipped stone (NOCS) characterisation programme and offer a brief overview of the Team's activities and publications since last year. We also welcome to our team a new member, Sonia Ostaptchouk from Paris, who is working with T. Carter on the West Mound Trenches 5 - 7 material excavated by the Biehl and Rosenstock team. Finally, we gratefully acknowledge the hard work of our new illustrator, Danica Mihailovic from the University of Belgrade.

4040 Area – Tristan Carter

With only a limited amount of excavation being undertaken within the 4040 Area this year, there was an opportunity to start working in greater detail through a series of assemblages from previous years. This included re-organizing and strewing the chipped stone by context, rather than by year as the material had hitherto been organized. This short report details some of the major discoveries and first impressions of these various assemblages, it is stressed that this represents a preliminary account of the material, with certain aspects likely to change by the time of the final publication.

Building 49

Work recommenced on Building 49, last excavated in 2004, it rapidly becoming apparent that the chipped stone assemblage from the structure was very similar to a number of other pre-VI assemblages from the 4040, BACH, North and South Areas. Typically for these 'earlier' assemblages are:

- a) A dominance of obsidian with all the visual characteristics of having come from the outcrops on East Göllü Dağ, with conversely only a small proportion of material from Nenezi Dağ.

- b) Clear spatial patterning in the distribution of the chipped stone within the structure's floor deposits (or closely related secondary deposits), with an artefact-rich 'dirty area' in the southern part of the building in association with ovens and hearths.
- c) Evidence for the 'in-house' working of East Göllü Dağ obsidian within these parts of the building, primarily in the form of biface thinning-flakes and other debris related to the reduction of biface preforms and part-cortical quarry flakes, the latter representing the 'raw material' for the manufacture of relatively un-standardized blade-like flakes (Carter, Conolly and Spasojević 2005: 223).
- d) Almost a complete absence of true prismatic blade products.

Much of the Building 49 obsidian was very fresh and at least 80% of it was estimated – on the basis of visual appearances – to have come from the various outcrops on the eastern flanks of the Göllü Dağ massif in southern Cappadocia (cf. Carter et al 2005; Carter and Shackley 2007). The most productive, and arguably informative, assemblage generated in 2008 came from unit 14460, a loose ashy layer in the SW and W part of the building (Space 339), previously excavated as unit 7957 in 2004. The deposit was interpreted initially as either imported midden material, or a building clearance episode with the soil and its contents being dumped in the structure's corner. In terms of the chipped stone, this was an extremely obsidian-rich assemblage, similar (albeit slightly more spread-out) to the pre-Level VI dirty floor assemblages excavated in the South Area during the 1990's (such as Building 6, 17, 23 inter alia), with hundreds of pieces of fresh microdebitage coming from heavy residue (Table 14).

The material tended to be fresh and with a great many complete pieces, whereby we would interpret this deposit as being near-as-dammit in situ (allowing for a little bit of sweeping / movement within the general southern area close to oven / hearth), i.e. we would reject the idea that this was re-deposited midden material. Of the 237 pieces of obsidian from the >4mm sample, while it is quite apparent that while East Göllü Dağ obsidian dominates (in keeping with pre-Level VI assemblages), Nenezi Dağ material is also present. Unfortunately it is impossible to provide a decent estimate of these raw materials' relative proportions due to the large quantity of small/thin and translucent pieces which are difficult to discriminate visually.

Table 14: Chipped stone productivity by heavy residue samples from unit 14460.

Unit	Material	Fraction	%	Vol.	No.	No./L	Wgt	Wgt/L
14460	Obsidian	>1mm	12.5	18	83	36.89	0.24	0.11
14460	Obsidian	>2mm	25	18	142	31.56	1.68	0.37
14460	Obsidian	>4mm	100	18	237	13.17	64.06	3.56
14460	Flint	>4mm	100	18	3	0.17	4.6	0.26
14460	Flint	>4mm	100	18	1	0.06	2.24	0.12

Significantly, the >4mm sample includes a small rough biface (a preform) made of East Göllü Dağ obsidian (with the blue tint that one associates with the Kömürcü-Kaletepe material in particular) together with at least 15 thinning flakes from biface finishing. The manufacture of these biface preforms (i.e. bifacially retouched spear- / arrowheads) in a rough / preform state is known to have occurred at the Kaletepe Sector M site atop the Kömürcü obsidian outcrop on East Göllü Dağ obsidian (Cauvin & Balkan-Atlı 1996, 257 & fig. 7.1-2; Balkan-Atlı & Der Arahamian 1998, 249-52 & fig. 10).

Given the location of this artefact-rich deposit and the nature of its contents, it seems likely that Building 49 originally contained a hoard of these biface preforms (cf. Carter 2007; Conolly 2003). A number of shallow depressions (largely empty) have already been located within this part of the building (units 13602 and 13648). Finally, another biface preform of the same raw material came from 7957.X4 (fill within plastered lines/possibly under surface), the same deposit as that which contained the animal figurines and is considered depositionally analogous to (14460).

Building 52

A relatively small quantity of chipped stone came from the western part of Building 52, mainly from fill deposits. In terms of technology, typology and raw materials, these assemblages are quite similar to those from Building 49, though one does note the occasional pressure-flaked blade made from Nenezi Dağ obsidian (e.g. unit 16701). The most productive deposit was layer (16745) that contained 32 pieces of obsidian from the dry sieve, of which 29 had the appearance of being from East Göllü Dağ (mainly Kaletepe) and included a small biface preform, plus lots of fresh non-cortical flakes (including biface thinning flakes), some chunks / exhausted blade-like flake cores and a single pressure-flaked prismatic blade. The one truly interesting find was half of a relatively large biface preform (6.15cm long) made of East Göllü Dağ (Kaletepe) obsidian that came from the floor of a bin (16763.X1). We would argue that this piece had been deliberately placed there at the time of this part of the building's abandonment and is thus directly analogous to the placement of the stemmed projectiles in the bins from space 93 excavated three years ago (see Twiss et al 2008).

Building 67

A small quantity of material was generated from Building 67 in 2008, its characteristics indicating clearly that it is later in date than the assemblages from Buildings 49, 52 and 77. The majority of the obsidian appears to have come from Nenezi Dağ and true prismatic blades, some of which are pressure-flaked, are well represented, plus a couple of diagnostic products from opposed platform technologies, including epsilon blades (e.g. from room fill 14103).

Building 77

Considering the wealth of interesting finds from Building 77, it has to be said that chipped stone was not particularly well-represented in this structure, with the current impression that it had a very low density of material from the major infill deposits. In terms of the obsidian's typo-technological characteristics and raw materials, the assemblage seems to be slightly later in date than those from Building 49 and – at first glance – not that dissimilar to those from Building 52.

The obsidian seems to be dominated by East Göllü Dağ products, mainly in the form of non-cortical blanks, including thinning flakes from biface reduction (examples from room fill deposits 16402, 16454, 16457, 16479), and debris from the manufacture of percussion blade-like flakes. In turn, there was a small quantity of blade products, apparently made of both East Göllü Dağ and Nenezi Dağ obsidian. A not insignificant number of these blades had been modified into projectiles, with a small, complete tanged projectile made of East Göllü Dağ obsidian from 16461, plus another tanged point, this time made on a large blade from an opposed platform technology (quite rare in this raw material) complete and measuring 9.33cm long, from the infill of Space 337 (16469.X2). While its tang was completely retouched, all other modification was largely restricted to the edges of its dorsal surface, making it directly comparable to that from one of the bins in Building 52 (see 2006 Archive Report). Another point (near-complete, 8.33cm long), bifacially retouched into a leaf-shape, again made on a thick blade of East Göllü Dağ, came from another Space 337 infill unit (16487.X7). The inclusion of complete projectiles within the infill of the structure is also reminiscent of practices documented in the southern part of Building 52 (Twiss et al 2008). There were also two large fragments of opposed platform blades made from Nenezi Dağ obsidian that had also originally been worked into points (from 16454 and 16469), that technologically are likely comparable to the blade material from the Building 1 hoard of Level VII-VI date (Conolly 2003: 59, fig. 5.7).

Space 60 and 271

These parts of the site provided a series of interesting assemblages in terms of their relative raw material proportions and technology. While dominated by East Göllü Dağ products, there is a greater relative proportion of Nenezi Dağ obsidian than in earlier deposits (c.15-20%), suggesting that perhaps we may have been wrong in our previous assertions as to the rapidity of change in raw material procurement strategies around the Level VI mark (cf. Carter et al 2005). This important issue represents a focus of ongoing post-excavation study in the 4040 and South Areas and will be commented on in detail in the forthcoming volumes.

The East Göllü Dağ component includes bifacial point fragments, thinning flakes and the residue from the manufacture of percussion blade-like flakes; much of the material has the appearance of coming from the Kaletepe outcrops. The Nenezi Dağ material includes unipolar blade products and a few from opposed platform cores (a tablet from such a nucleus came from 14191). A number of these blades had been modified into various types of projectile, including a unifacial example (also 14191) with an elongated tang comparable to examples from Level VI (cf. Bialor 1962: Fig. 3, 10).

South Area – Marina Milić

The first part of this report focuses on the assemblages from Building 75, i.e. the structure stratified beneath Buildings 65, 56 and 44. The 2008 excavations in B. 75 produced clear evidence for the in situ production of obsidian projectiles, with concentrations of small, freshly knapped non-cortical flakes generated during the modification of thick, possibly imported, opposed platform, blades into bifacially retouched points. Projectiles are one of the most diagnostic tool types at Çatalhöyük and their production within the settlement has until recently been evidenced mainly through the recovery of performs or unfinished objects (cf. Conolly 2003; Carter 2007). In the last couple of seasons in the South Area we have recovered a number of knapping deposits that indicate that the manufacture of projectiles took place within households. Furthermore, this year produced another interesting situation, whereby the manufacture of stone beads also seems to have taken place in Building 75, as represented by presence of numerous micro-blades and micro-drills found as a part of a floor deposit in Space 328.

The obsidian and flint artefacts from Buildings 44, 56 and 65 have already received preliminary discussion in previous archive reports. In the second part of this year's South Area report there will be a greater focus on the material from the midden area associated with the Buildings 44, 56, and 65.

Knapping in the South Area

In this section I will discuss a series of debitage clusters / projectile knapping deposits in the South Area, including assemblages from Building 56 (Space 121, Unit 12873), Building 75 (Space 332, Unit 16536) and Building 75 (Space 328, Unit 17069).

The knapping deposit within Building 75, Space 332 drew much attention this season. The excavators noticed that the surface of this space, especially in the central to western part, was densely covered with obsidian debitage. They decided to separate this area into 1m² grid squares in order to record in greater detail the density and distribution of the deposit (Figure 158). The soil from the whole unit (16536) was then sent to flotation with the aim to collect 100% of the material located in the space (I would like to thank the excavator James Taylor for careful excavation and sampling and Milena Vasić for efficient heavy residue procedure). In the same building, Space 328, we also had a small concentration of obsidian debris that was located in the NE corner of the space. In considering the significance of major spread of obsidian from Space 332, it is beneficial here to mention similar situation / assemblage from Building 56, excavated in 2006 (see 2006 archive report) which provides us with a knapping deposit for comparison.

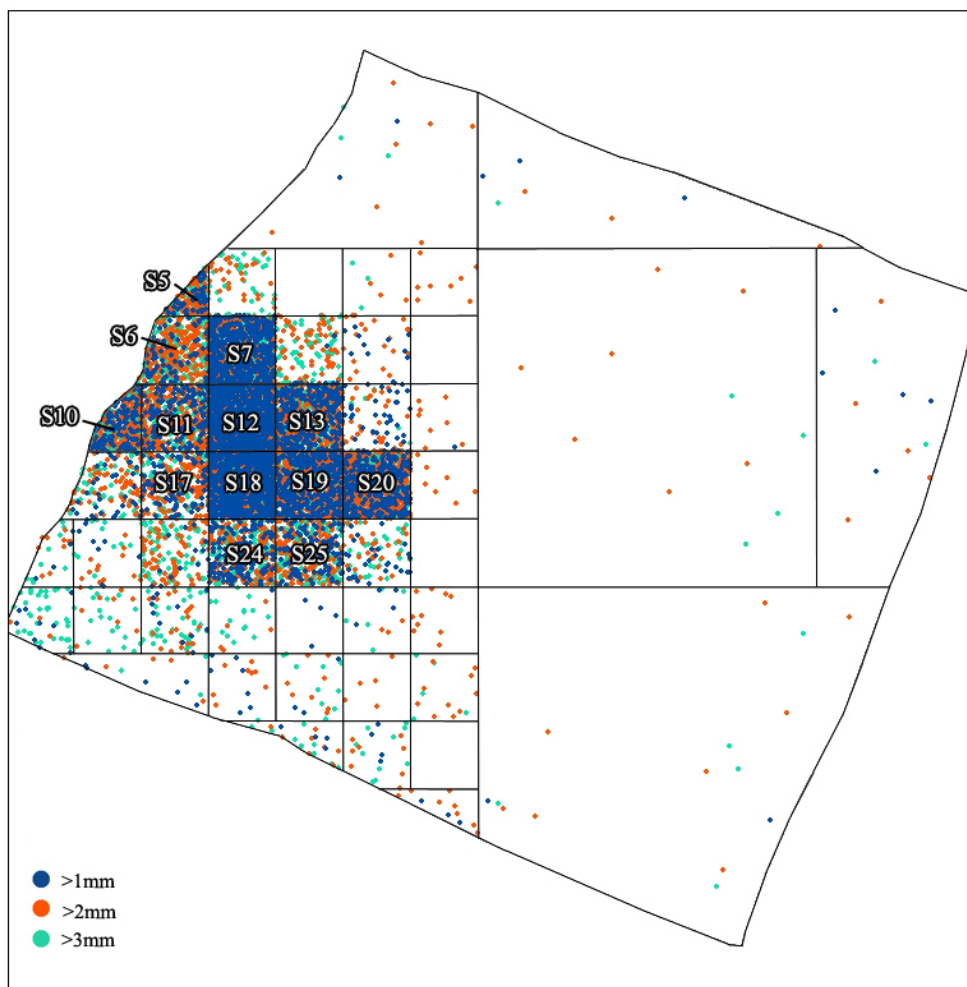


Figure 158: Density distribution of (16536)

To remind ourselves, the extremely rich obsidian assemblage from Building 56, Space 121 unit (12873) (“cluster/in situ knapping deposit”) was deposited at the time of the construction of a bench (F.2056) and platform (F.2055), comprising 2494 pieces of obsidian (58.91g) (Figure 159 - 1093 pieces (3,29g) from >1mm, 939 pieces (12,61g) from >2mm and 334 pieces (33,54g) from >4mm). This deposit was interpreted as the by-product of in situ knapping based on the quantity, density, freshness and completeness of the hundreds of blanks (chips, flakes, etc). The material is extremely homogenous with regard to raw material (it all appears to be Nenezi Dağ obsidian) and the type of blank, suggesting that this knapping debris related to a specific kind of production, namely the transformation of large non-locally manufactured blades into projectiles – as evidenced in part by the recovery of one projectile tip from the >4mm sample.

Returning to the new Building 75, Space 332 assemblage, if one considers at face value the quantity of obsidian from “cluster/debitage spread” of unit (16536) in terms of its weight and count per litre of soil, then this assemblage would appear less impressive than that discussed above from Building 56. This however, is a reflection of the fact that the unit comprises a far larger spread of soil (142.5 L compared to 13L), within which the cluster was unevenly distributed (Figure 158). In fact the most productive samples in this unit (S7, S12, S13, S18, S19, S20) are richer than that of Building 56’s 12873 (Figure 159). The total number of chips and flakes from this cluster is 6482 (131,44g) all of which came from heavy residue (3298 pieces (10,54g) from >1mm, 2384 pieces (30,42g) from >2mm and 809 pieces (90,48g) from >4mm). This new deposit from Building 75 is interpreted as representing essentially the same activities as that from 12873 (Building 56), i.e. the transformation of large Nenezi Dağ blades -

which we think were imported ready-made from quarry-based specialist workshops - into projectiles (It should be stated here that while we are confident as to the source of these obsidian blades, our statements are currently based on visual inspection alone). The assemblage is thus dominated by small, fresh, largely complete non-cortical chips that were removed from the surface of these blades (initiated from their margins) that served to both thin the blade and shape it into a more aerodynamic form. Further evidence to support this interpretation is provided by an actual projectile fragment (from sample 18, >4mm, either a tip or tang [16536.A1]).

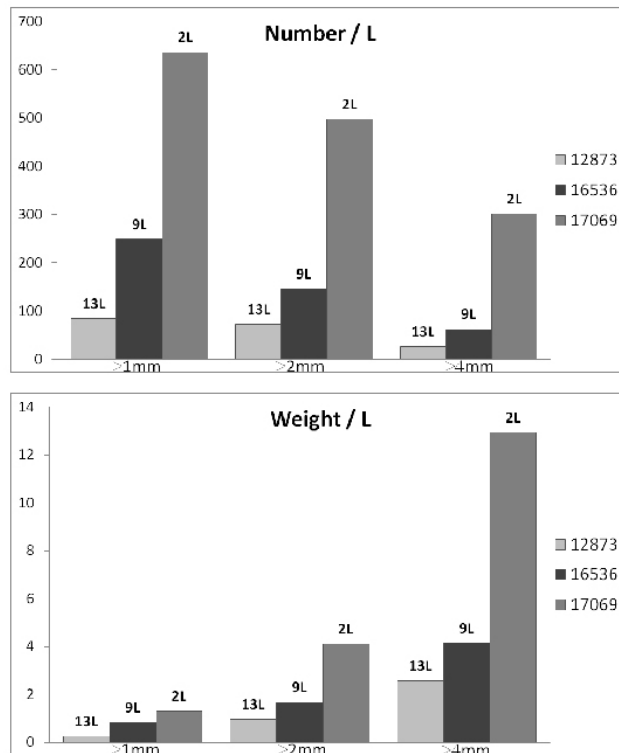


Figure 159: (12873) on platform F.2055, Building 56

Finally, it is necessary to comment further on the second interesting obsidian deposit from Building 75, that of unit 17069 in Space 328, which was located in a small square cut in the NE part of the space. This cluster contained 2868 chips in total, weighing 36.71g (1272 pieces (2.61g) from >1mm, 994 pieces (8.22g) from >2mm and 602 pieces (25.88g) from >4mm). While graphs show that this deposit is much richer than the previous two, this material is not thought to be in situ. Instead it seems like we have an accumulation / deposit of manufacturing debris that was swept from a nearby floor surface into this cut after the knapping event. The chips were concentrated in one small group and not scattered as in previously mentioned deposit. The quality of flakes - shape, size and freshness are comparable to deposits in Spaces 121 and 332 but importantly, this cluster also contained a projectile fragment (17069.X1) suggesting that once again this material related to projectile production.

Bead production in Building 75

Another extremely interesting set of material from Building 75, Space 328, is a concentration of chert micro-blades and micro-drills, especially within unit (16565) (Figure 160). It is very important that these blades (36 in total of which 19 had been retouched into drill bits) were found on a floor context. The whole assemblage came from the >4mm heavy residue sample, a recovery bias that again confirms the important role of water sieving for us in the archaeological process, as it is almost impossible to spot objects of this size and colour during excavation. The raw materials are different types of chert, varying in both their colour (white, beige, light brown and brown) and quality. The majority of the assemblage is made up of micro-blades (n=26, average size 1.41 × 0.72 × 0.20cm) produced by unipolar pressure-flake technology. Micro-blades made of chert are common at Çatalhöyük in the Aceramic Neolithic sequence (especially Level Pre-XII.B-D) where they were usually transformed into asymmetric microliths (Carter, Conolly and Spasojević 2005).

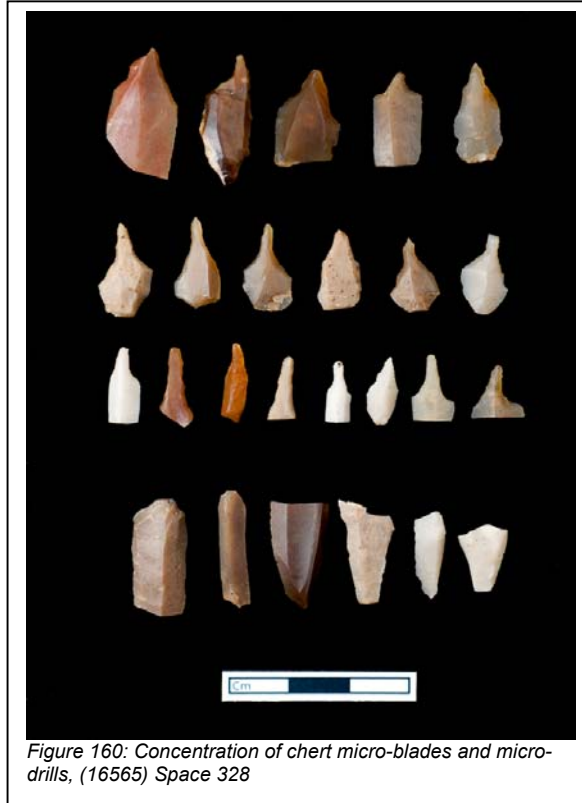


Figure 160: Concentration of chert micro-blades and micro-drills, (16565) Space 328

In the case of B. 75, these micro-blades represented the blanks for the manufacture of small drills with seemingly a specific, standardized function (a detailed microwear analysis would hopefully confirm this). These micro-blades were in most cases modified with direct marginal bilateral retouch on their distal end to form a pointed tip for use. After communication with Roseleen Bains (Beads Team) it was suggested that these drills represent drill bits for bead production, not least due to the fact that the same area produced quite a few bead blanks and preforms (Bains pers. comm.). It has been reported previously that stone drills could have been used to perforate bead preforms (Wright and Bains 2007) but experimental work and use-wear analyses will be necessary to ultimately confirm the function of the B.75 drill bits. For the moment, we can point to a good parallel of drill bits found at Kumartepe in east Turkey, whose use-wear analysis indicated had indeed been used for bead manufacture (Calley and Grace 1988).

Midden deposits in Spaces 319 and 339

Excavation in 2008 of the midden deposits in Spaces 319 and 339, revealed large quantities of chipped stone artefacts. Space 319 produced 1672 pieces of obsidian (471.14g) and 30 of flint (35.14g), while Space 339 produced 937 pieces of obsidian (285.95g) and eight pieces of flint (9.78g). Aside from their size, these assemblages are also important to us because they can be linked to and compared directly with material found in Buildings 44 and 56 (The midden deposit associated with the lowest building in the sequence, Building 65, comprises the material from Spaces 329 and 333 and not discussed in this report). The middens in Spaces 319 and 339 are associated with the aforementioned buildings and will allow us to get a much fuller picture of the production and consumption of chipped stone implements associated with these structures. More detailed technological and typological analyses need to be completed, thus this report will only offer some preliminary thoughts about nature of the assemblages.

Richness of the deposits

These midden deposits appear to be quite rich with regard to chipped stone; on average the deposit from Sp. 319 is slightly more productive than deposit from Sp. 339 and some of the most productive middens from the 4040 Area such as Spaces 279 and 280 with the exception of unit (12971) from Sp. 279 (Figure 161).

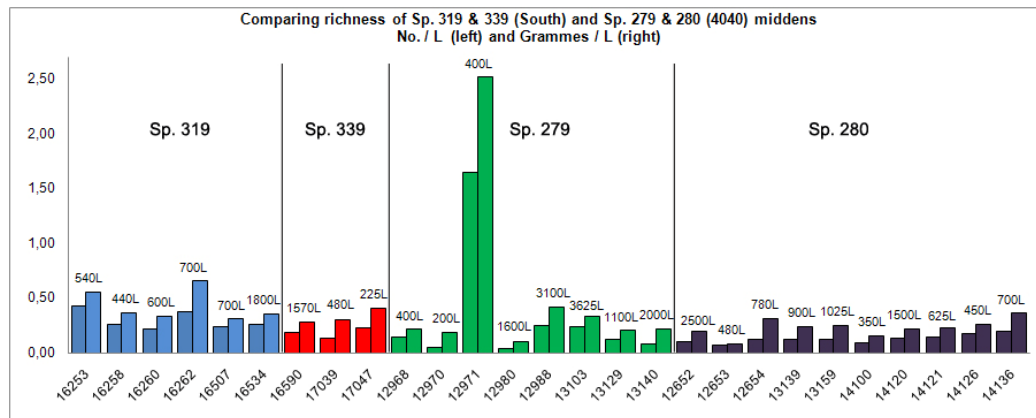


Figure 161: Richness of deposits

While it is not possible at this time to make detailed comparisons between the various assemblages from these two spaces, it can be stated that in general they show quite similar technological and typological characteristics:

- Typically for midden deposits, Spaces 319 and 339 contain a wide range of material, from production debris (exhausted cores, broken flakes, chips and chunks) to end products (regular prismatic blades).
- While these assemblages include a wide range of blanks, it remains that the bulk of the material from both spaces could be categorized as end-products (c. 65%), including primarily unipolar prismatic blades but also a few blades knapped from opposed platform cores. A large number of the blade products (all types), together with some of the flakes, were retouched and used. This is very similar to what we see with the 4040 middens from Spaces 279 and 280 (see 2006 Archive Report).
- The most common tool types are retouched blades modified by marginal or linear retouch along one or both edges. In addition there are also some denticulated and notched pieces in both spaces while backed pieces are more frequent in Space 319. There are slight differences when it comes to some of the less standardized tools that appear in these assemblages (and the site in general). Carving tools are more common in Space 319, while Space 339 (Level V) has produced some new tool types that seem to appear on the site as early as Level V – a Çayönü tool and an Upsilon blade (a distinctive by-product of the large opposed platform blade technologies).

The former type is already known from the Building 65 (Level VI) and, importantly, in c. Level VI contexts of the 4040 Area. 'Çayönü tools' from the Space 339 (17058.A1 and 17039.A3) are small, irregular and fragmented and again seem to be of the Çatalhöyük variety (see Archive Report 2007). Distinctive bipolar Upsilon blades also appear in the South Area (Space 314) but are well attested in the 4040 and North areas (see previous archive reports).

The most noteworthy object from Space 319 is an obsidian mirror fragment (16568.A1) (Figure 162). This is the first example of a mirror from a Neolithic context found at Çatalhöyük since the 1960's excavation (an unfinished mirror was found in 2004 in the fill of a Byzantine grave that had been cut into a Neolithic midden [see Archive report 2004]). The mirror was made from what appears to have been a large blade-core made of Nenezı Dağ obsidian (2.87 × 3.82 × 2.81 cm) whereby the platform of the core has been rejuvenated (removed as a

core-tablet) and polished into reflective surface. The piece is unfinished / broken; its original surface was probably approximately 5-6cm in diameter.

- The vast majority of the material was recovered in a fragmentary state, again typical for midden deposits; it is also quite fresh, indicating that it was dumped and buried quite rapidly after the artefacts production and/or use.
- Raw materials – typically the obsidian appears to be comprised of southern Cappadocian obsidians, with the Nenezi Dağ source dominant (c. 86.5%) with a minority (c. 13.5%) of East Göllü Dağ in Space 319 while in the Space 339 Nenezi Dağ obsidians comprise 91.4% and East Göllü Dağ 8.6%. This ratio shows an unusually high percentage of East Göllü Dağ obsidian, especially in Space 319, when compared to what we consider to be contemporary midden deposits in the 4040 Area (e.g. Spaces 279/280) and other post Level VI contexts, where Nenezi Dağ often represents c. 95%. We are well aware that the ratios of these raw materials change through time at Çatalhöyük, but these assemblages are starting to provide us with some important differences that may be of chronological significance, or perhaps suggestive of differential procurement / consumption practices within amongst contemporary members of the community (cf. Carter and Shackley 2007).



Figure 162: Mirror fragment 16568.A1, Space 319

Dating

Typically for a post-Level VI assemblage the dominant products are fine prismatic blades. They are made primarily by pressure-flaked technology, while the much rare opposed platform products are likely to have been manufactured by highly skilled direct percussion techniques.

Summary

- Richness – compared to the middens of Spaces 279 and 280 this is quite rich deposit (if we 'ignore' unit 12971 from Sp. 279)
- Typically for post Level VI assemblages it contains quantities of prismatic blades.
- Structurally the assemblage seems quite typical for midden – it is dominated by blanks that are relatively fresh and broken.
- The material includes knapping debris as well as used and retouched artefacts, i.e. what we consider to be 'household' objects.

Report on the Study of the Chipped Stone from the IST Area 2008 - Nurcan Kayacan, with contributions by Nejl Kurt

Introduction

A team led by Istanbul University's Mihriban Özbaşaran excavated in the third season on the IST Area of Çatalhöyük East in 2008.

The chipped stone industry of the IST Area has been under study since 2005. In these years, our analyses and recording used the database program developed by T. Carter, S. Delerue and M. Milić. Our studies thus aimed to both use and develop this system by drawing upon our experience and expertise from working on other Neolithic assemblages in central Anatolia and on the Cappadocian obsidian raw material sources. Thus, for example, we have introduced into the Çatalhöyük chipped stone recording system a much more detailed analytical scheme for the recording of (obsidian) raw materials, based on our work at Aşıklı Höyük, Musular and Kaletpe in West Cappadocia.

Table 15: IST Area chipped stone from 2008, by raw material and means of recovery

	Fast Track	Dry Sieving	Flotation	TOTAL
Obsidian	221	28	8	257
Flint	3	-	-	3
TOTAL	224	28	8	260

With this new method, the analysis, 16 different types of obsidian were defined according to various macroscopic characteristics (colour, translucency, texture, banding, inclusions etc), with the creation of a reference collection that was then sampled in 2005 for actual elemental characterisation (in France and the US). Our main aim is to try to recognise visually the products of the various obsidian sources (Our worked is also based on the chemical analyses of obsidian by B. Gratuze and colleagues of obsidian from Aşıklı Höyük, Musular and Kaletepe) and recompose the blocks of knapped obsidian. This worked has shown that the people of Çatalhöyük were intensively using obsidian from the (East) Göllü Dağ and Nenezi Dağ sources of southern Cappadocia (see also Carter et al 2005; Carter and Shackley 2007). One of the important results of our work was Kayacan's recognition of a small group of prismatic blades from the IST Area that were made from a "green oily" obsidian (see Table 16), that were thought to have come from sources in eastern Anatolia (see previous Archive Reports). This suspicion has happily been proven subsequently by an elemental characterisation study at the Musée du Louvre (CNRS) in 2007, the results recently published in *Antiquity* (Carter et al 2008).

Our work on chipped stone technology is also continuing. Our preliminary results indicate that products of unipolar blade technologies are dominant in the IST Area obsidian assemblage, most of which appear to have been manufactured by a pressure technique (or techniques). This technology is mainly represented by central blades, i.e. true prismatic blades with trapezoidal cross-sections, plus parallel margins and dorsal ridges. Typological analyses have recorded the presence of points, retouched blades and flakes, scrapers, splintered pieces and carving tools amongst the assemblages studied in 2005, 2006 and 2008.

The 2008 study

In the 2008 excavation season our analyses dealt with the study of 260 individual pieces of chipped stone that were collected from 29 units (Table 15), of which 211 came from 'fast track' contexts, 28 from dry sieving, and 5 from heavy residue samples (a by-product of the archaeobotanical floatation system). These units derived variously from Spaces 253, 283, 284, 289, 330, 338, of which Spaces 283, 284 and 289 belong to Building 63.

Raw Materials

In 2008 we continued with our macroscopic analyses of the various (obsidian) raw materials represented within the IST Area assemblage, the same method also being used to record the South Area material. To the scheme developed initially by Kayacan, were four new types added by Marina Milić (Table 15). In addition, these obsidian type samples were photographed by Marina Milić (Figure 163a-163b - We are thankful to M. Milic and T. Carter for their friendly support to our methodology).

According to our former experiences and the chemical results from the analyses of our type samples, our study shows that Nenezi Dağ products were dominant in the IST Area obsidian assemblage, with Göllü Dağ obsidians comprising only about a third of the material

Building 63 (Spaces 283, 284, 285 and 289)

The main Neolithic structure of the IST Area, Building 63, has been excavated over three excavation seasons: 2005, 2006 and 2008 (see Özbaşaran 2005, Özbaşaran and Duru 2006 and 2008 Archive Reports). In 2008, the work was concentrated in three areas:

Table 16: Obsidian classification scheme for Çatalhöyük (developed by Kayacan, with later input by Milić)

OBSIDIAN CLASSIFICATION SCHEME	
Type Description	Current Hypothesized Source
1. Transparent with sprinkled grey inside	Göllü Dağ
2. Smooth, slimy greenish-grey	Nenezi Dağ
3. Transparent with tinny white stripes	Göllü Dağ (Kaletepe?)
4. Greenish-grey almost matt (smoky)	Nenezi Dağ
5. Greenish-grey with darker stripes inside	Nenezi Dağ
6. Completely transparent	Göllü Dağ (Kayırlı or Erikli Dere)
7. Ashy greenish-grey	Nenezi Dağ
8. Greenish-grey with darker stripes on the surface	Nenezi Dağ
9. Grey, mat, sprinkled, rough surface	Nenezi Dağ
10. Ashy with dark stains	Nenezi Dağ
11. Opaque green	Nenezi Dağ
12. Transparent (<i>dark blue</i>)	Göllü Dağ
13. Grey with sprinkled surface	Nenezi Dağ
14. Grey, matt with rough surface	Nenezi Dağ
15. Green oily	East Anatolia (Bingöl?)
16. Completely transparent (<i>yellowish</i>)	??? currently unknown
17. Intensively back sprinkled	Nenezi Dağ (?)
18. Opaque black shiny	Nenezi Dağ / Göllü Dağ / East Açıgöl Ante Caldera
19. Grey matt with inclusions (spherulites)	Nenezi Dağ (?)
20. Dark blue sprinkled	Göllü Dağ (Kaletepe)

Space 283

Space 283 is interpreted as the storage room of Building 63 and is comprised of units 13934, 13952, 13978, 13994, 13995. From these contexts a total of 13 pieces of obsidian and 1 piece of 'flint' from Fast Track excavation contexts, have been brought to the laboratory and inventoried. According to the results of our study of the material, the obsidian comprised central blades (15), flakes (1), fragments (3) and chips (1). Only one retouched blade was observed.



Figure 163 a: Obsidian raw material classification types 1-10 (by Marina Milić)



Figure 163 b: Obsidian raw material classification types 11-20 (by Marina Milić)

Space 284

Space 284 is Building 63's main room, together with Space 285, constituted by units 13924, 13925, 13926, 13932, 13961, 13986 and 13992. Sixteen pieces of obsidian came to the lab from these contexts, all 'Fast Track', eight of which came from heavy residue. The material includes flakes (4), central blades (13), chips (2) and fragments (2); blades like flake (1) and an exhausted core (1). Only one retouched blade was recognised.

Space 289

Space 289 is a long and narrow side-room located on the NW of the same building, made up of units 13927 and 13946, which produced 5 pieces of obsidian (all excavated as 'Fast Track').

This material comprise: central blades (6), blades (5), fragments (2) and flakes (2).. One retouched blade was observed.

Space 253

Units 13934, 13952, 13978, 13994 and 13995 represent external Space 253, which generated seven pieces of obsidian and one of 'flint', again all recovered by the 'Fast Track' process. This material comprised: fragments (4), flakes (2), blades with natural surface (1) and one chip (1). There were no tools.

Space 338

Space 338 is made up of unit 13983, from which came 8 pieces of obsidian (again 'Fast Track'), including: blades (1), flakes (2), fragments (3), chips (1) and a rejuvenation piece (1). No tools were observed.

Space 330

Units 13920, 13921, 13922, 13929, 13947, 13953 and 13957 constitute Space 330. This space was very productive in terms of chipped stone finds, with 139 pieces from 'Fast Track', and 28 from heavy residue. This material comprised: central blades (60), blades (18), flakes (18), fragments (26), chips (25), blades like flake (2), blades with natural surface (2), core tablets (2) and a bladelet.

Conclusion

In 2008, the chipped stone industry of the IST Area was studied using the same methodology of the 2005 and 2006 seasons. Technological analysis showed that pressure technique was the main technique used for obsidian blade production. However our work continues on the variety of the technology and how many different mechanisms were used in IST Area. In the coming year, our studies are planned to be focused in this research direction.

When we look at the material from the typological point of view, we see that only retouched blades were registered. Scrapers, splintered piece, carving tools and polishing tools were not found as in 2005 and 2006.

Work on the chipped stone of IST Area of the past three seasons has presented an important set of results with regard to the use of different (obsidian) raw materials. Eastern Anatolian obsidian has been positively identified for the very first time in the new excavations here in the IST Area. Moreover, it seems to be very interesting that this material has not yet been documented in other current excavation areas. Therefore, the IST Area gives the possibility to test whether there are any preferences on the selection of the raw material when different technologies are concerned. Our research will continue with this approach.

The Chipped Stone from the West Mound: Towards a Characterization of Early Chalcolithic Lithic Production - Sonia Ostaptchouk

Background

While the last three years produced no secure prehistoric contexts on the West Mound, the 2008 excavations by the Biehl and Rosenstock, plus Selçuk teams produced a series of undisturbed Early Chalcolithic deposits in Trench 5, thus giving us an exciting new opportunity to study and characterize the chipped stone technology of the Early Chalcolithic I period. Moreover, with the material recovered from the deepest layers of the Trench 7 deep sondage (dug in 2007) we can perhaps ultimately have a clear idea as to the nature of the latest Neolithic/ earliest Chalcolithic 'transition'.

The material presented in this preliminary report includes all the chipped stone from the 2007 and 2008 excavations in Trench 5 (comprising 5 different spaces this year: 310, 340, 341, space at the East of 341, and 342) and Trench 7. It is important here to remind you of the different excavation and recovery strategies used in these two areas, with large parts of Trench 7 excavated mechanically, while a great deal of the 2007 Trench 5 material was dug using the 'fast track' system. As such, it remains that it is only from 2008 onwards that we will have well-controlled and un-disturbed assemblages with which to reconstruct not only the

various technologies represented in the Early Chalcolithic chipped stone, but also how and where they were making and using these implements within the site.

Despite the different archaeological contexts and the composition of the assemblages (secure/insecure contexts, Trench 5/trench 7), the obsidian appears quite homogeneous. This homogeneity is found not only in the technological characteristics of production but also in the state of the material, which is generally fresh and sharp-edged. The comparable state of the obsidian arguably suggests similar post depositional histories for this material. In contrast, the surface state of the 'non-obsidian chipped stone' [NOCS] is heterogeneous: some components are fresh while other artefacts are completely dulled. For some artefacts, their surface smoothness is irregular or partial, likely the result of differential use-wear. In other cases the artefact is completely dulled, masking traces of retouch and use. In such cases the dulling may be the result of taphonomic processes rather than utilisation; they may be intrusive elements from much earlier and / or exposed deposits. Future work will compare the state of the chipped stone from secure and insecure contexts to help me understand these issues more clearly.

The aim of this first preliminary report is to begin discussing the characteristics of the chipped stone from the new West Mound excavations (Trenches 5 and 7). Thus I hope to give a first outline of the chaîne opératoire of the lithic production and the phases, which are represented to help us understand both the nature of procurement of various raw materials and what stages of production (modification) are attested on site.

The chipped stone from Trenches 5 and 7

The 2007 and 2008 West Mound excavations produced c. 2.5 kg of chipped stone:

- Trench 5 – c. 1.3 kg of obsidian and c. 266 g of NOCS
- Trench 7 – c. 93 g of obsidian

The recording of the West Mound chipped stone follows the same methodology as used for the East Mound material, with two levels of analysis, comprising Level 1: a simple count, weight, obsidian/NOCS record in an Access-based central database, and Level 2: a detailed artefact-by-artefact mode of analysis, currently stored in Excel with the intention of merging into the central Access database next year.

Raw Materials

It should be emphasised that all the conclusions presented in this report concerning the characterization of the chipped stone raw materials are based on the visual macroscopic inspections alone (A large quantity of obsidian from the West Mound has however been elementally characterized at UC Berkeley, Stanford University and the CNRS AGLAE research facility at the Musée du Louvre in Paris; these data have yet to be published (TC)). In discussing the obsidian from the site I employ the visual characterisation scheme developed by Nurcan Kayacan and Marina Milić.

Obsidian represents approximately 97% of the raw material(s) represented within the West Mound chipped stone assemblages, with various types of NOCS making up the remaining 3%. Of great interest is the fact that while in the upper strata of the Late Neolithic occupation on the East Mound (4040 Area) where Nenezi Dağ products are claimed to comprise c. 95% of the obsidian (T. Carter, pers. comm.), on the West Mound (Trenches 5 and 7) it would seem that Nenezi Dağ and East Göllü Dağ materials are present in roughly equal proportions (Figure 164 - 166). This makes our current lack of analyses from the TP excavation area, that incorporates Levels III-0, all the more crucial to elucidate the nature and pace of changing procurement practices within the community (TC)).

The information that I can provide on the West Mound NOCS are for the moment quite anecdotal, as far less progress has been made on characterizing these raw materials (though see MacDonald, this report and previous work by Doherty and Milić). In general these materials are represented by retouched end-products and seem to be less varied than some of the earlier assemblages (those from the Level Pre-XII strata in particular [M. Milić, pers. comm.]), dominated by fine grained, cream-coloured chert/flint. It is thought that the biggest artefacts were probably imported ready-made as we preformed do not find the manufacturing

debris associated with their production. The fact that we also do not have the smaller flakes associated with retouching debris is probably to be explained at present by the fact that so few soil samples have been taken / processed from the site by water sieving (these blanks usually come from heavy residue samples) as only towards the end of 2008 were we excavating pure prehistoric deposits.

One final comment, Trench 5 produced a single example of brown opaque obsidian that has not previously been noted at Çatalhöyük; unfortunately the piece is not very technologically diagnostic (a chunk with a split fracture - With the Early Chalcolithic being renowned as a time when new obsidian sources began to be exploited and the trade in Anatolian obsidians became more “cosmopolitan” (Renfrew, Dixon and Cann 1966: 48), it is quite possible that this piece comes from one of the eastern Anatolian / Armenian sources, perhaps Pasinler or Arteni, although occasional reddish products are also seen in Cappadocia (TC)).

Technological aspects: Techniques and methods of production

Technologically it can be stated that most of the chipped stone from the West Mound relates to various forms of unipolar blade production. Indeed bipolar production is almost entirely absent anecdotic (just one opposed platform blade was identified from an insecure context).

Blades were usually recovered in a broken state, fragmentation all seemingly occurring naturally, rather than through deliberate human action (i.e. through their use and a range of post-depositional processes). Complete blades are rare and they unfortunately thus far only come from insecure contexts. While blade assemblages are dominated by medial segments, there are significant quantities of proximal sections whose various attributes allow us to distinguish two main types of production groups: (a) pressure blades and (b) percussion blades.

a) Pressure-flaked products – defined by their extreme regularity of the blanks, their thin mid-section, and for two whole blades their slightly curved profile at the distal part (Pelegrin 1988). We can also add the observation concerning the systematic preparation of the overhang by abrasion and smoothing prior to the removal of the blade. The preparation is made by a tangential abrasion of the platform edge from the platform towards the flaking surface with a soft stone. A second stage is an extremely tiny transversal smoothing of the edge (J. Pelegrin, pers. comm.). This means that the butts of the resultant blades are generally punctiform or very fine (1mm) with a 90° angle.

The morphology of the blades from Trench 5 is represented in Figures 164-165. Due to their fragmentation, only a comparison of width: thickness is made; that said, some experimental work has shown that these two attributes are among the most relevant to describe pressure production (For example these are the main two criteria are the main criteria used to describe the production of pressure blades at the PPN Syrian site of Sabi Abyad II (Astruc et al 2007)). With this morphometric study, in the light of experimental work, we can make hypotheses concerning the relative position of the knapper during the manufacture of these blade products (technique, posture and gesture). In the case of the Çatalhöyük West Mound material, we can envisage that for the main part of the production, the knapper was working either in a standing or a sitting position. The experimental assemblages give for a standing position a production of blades between 0.8 cm and 2.4 cm of width on obsidian and between 0.4cm and 1.6 cm of width in a sitting position (Pelegrin 1988; J. Pelegrin pers. comm.). All the pressure blades studied thus far derive from the plein débitage, i.e. the full rhythm of production (Table 17), with most having a 2-1-2' 'code' (reduction stratigraphy [cf. Binder and Gassin 1987]).

These observations on the pressure products are unfortunately based on a sample that contains large amounts of material from poor contexts; a more detailed qualitative and quantitative study will be undertaken in the future based purely on the analysis of pieces from secure deposits.

We must also determine in future studies if the high representation of the 2-1-2' blades is due to the method of production (i.e. the knapper had a very high level of knowledge and skill

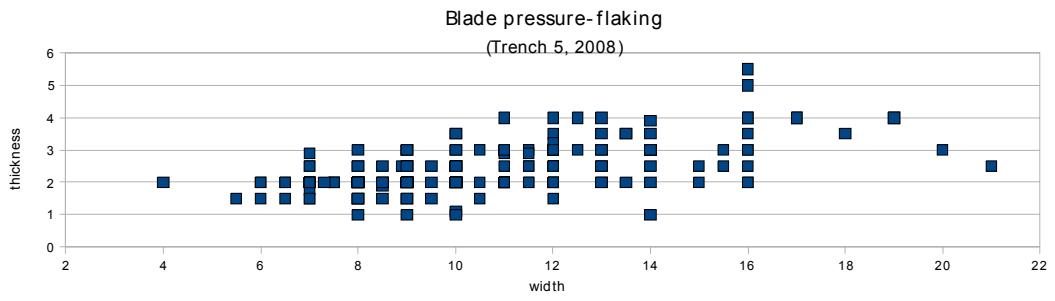
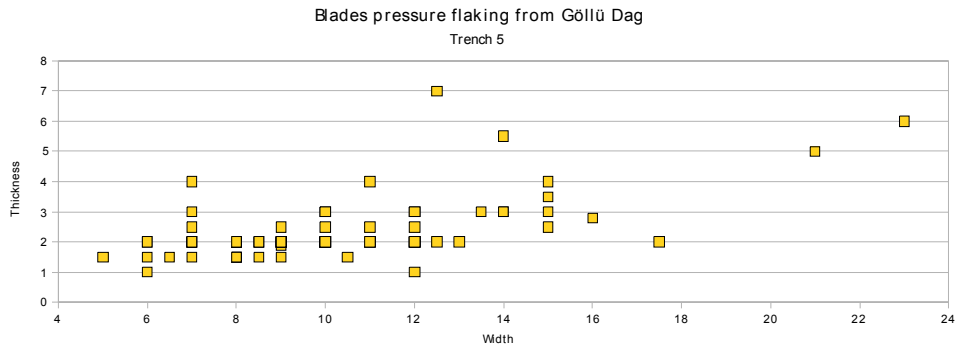


Figure 164: Width/thickness comparison of East Göllü Dağ and Nenezi Dağ pressure-flaked blades from Trench 5

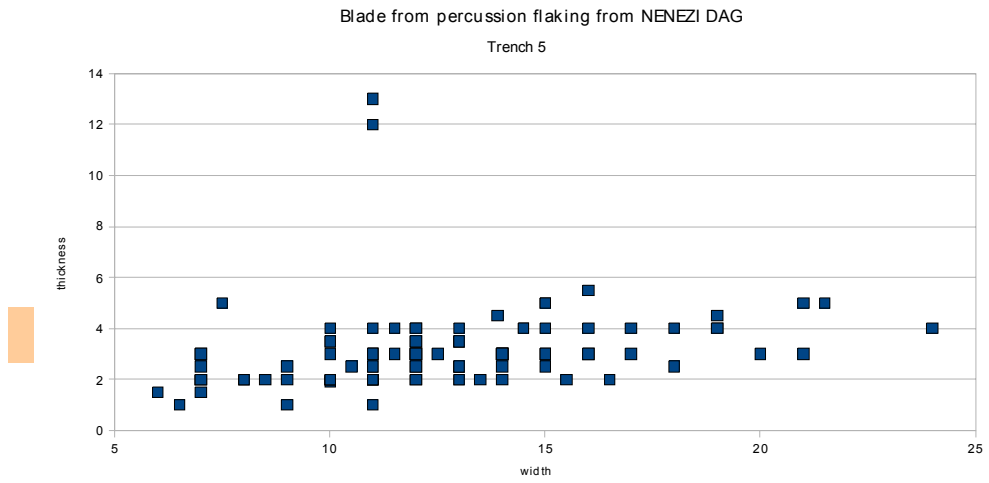
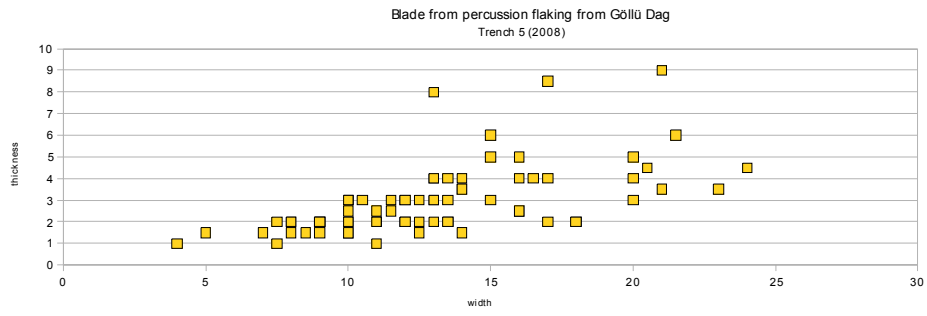
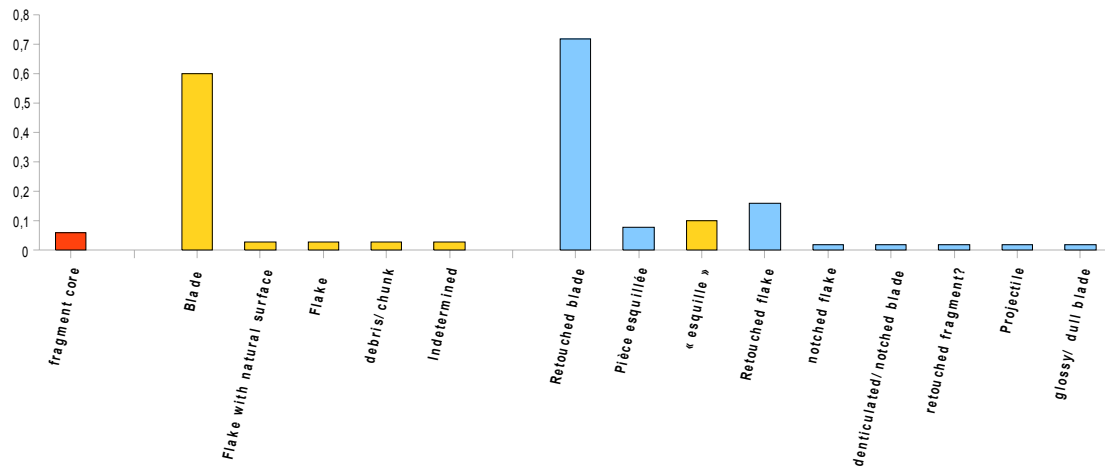
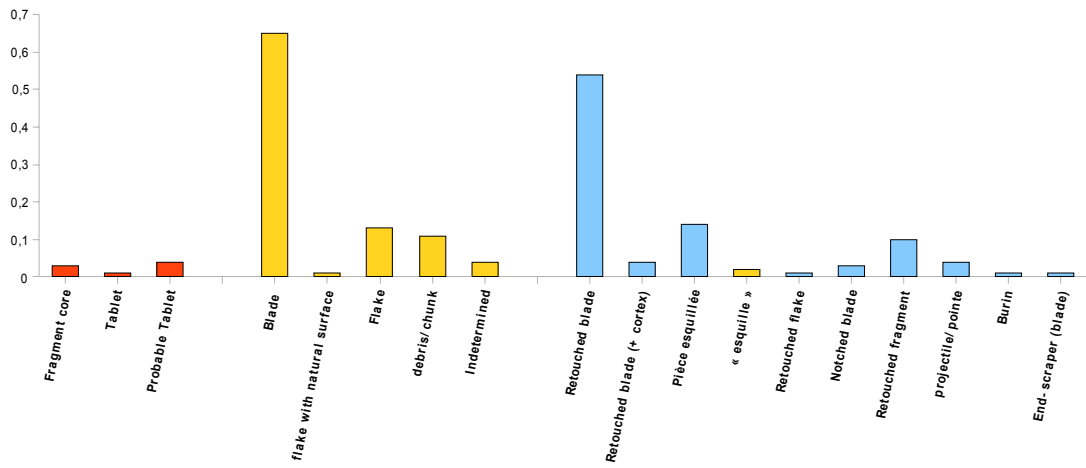


Figure 165: Width/thickness comparison of East Göllü Dağ and Nenezi Dağ percussion flaked blades from Trench 5.

Frequency of Technologic Groups represented
(Late grave Trench 7)



Frequency of Technologic groups represented (Transition Level, Trench 7)



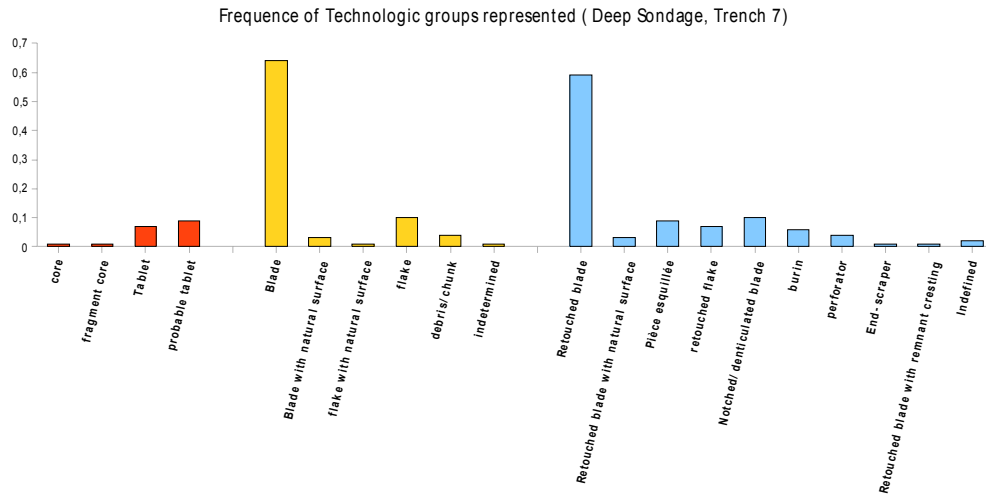


Figure 166: Technological classes represented in Trench 7.

Table 17: Blade scar run code (knapping stratigraphy) for blades from Trench 5 (GD = East Göllü Dağ; ND = Nenezi Dağ).

Blades and Code (Trench 5, 2008)

Code 212'	Code 123	Code 12 ou 21	3 armis
ND 135	ND 2	ND 27	ND 18
GD 53	GD 2	GD 15	GD 12

whereby they were able to recurrently produce such regular end-products), or whether it is a reflection of blank selection (with all other blades being left in another part of the site).

b) Percussion products – the manufacture of the production by blades by a percussion technique using a soft hammer is apparently attested here in the West Mound obsidian assemblage through the recovery of a quantity of blanks, whose edges, width and section are irregular, while undulations are also observed on the ventral face. Interestingly, the West Mound percussion blades do not have the distinctive faceted butts that Marcin Waş noted on the percussion blades from the TP Area (Carter et al 2006: 271). The butts of the West Mound percussion products are generally a little more notable than the butts of the pressure blades from this part of the site (c. 1.5mm - 3mm wide). The two techniques do, however, share the same preparation of the overhang toward the flaking surface (abrasion but the smoothing is less systematic) and the same inclination (90°).

The aim of our next study will be to understand the relationship between these two modes of blade production. Do we have two independent chaînes opératoires or do we have one chaîne opératoire with the use of two different techniques during knapping?

The West Mound assemblage also contains a quantity of flakes, most of which are considered to relate to the aforementioned blade production strategies and include some distinctive rejuvenation pieces. These flakes and core-tablets represent evidence that at least some of the blades being used on the West Mound were also produced there; unfortunately no cores were found this season (A large conical percussion blade core was found on the surface of the West Mound last year and is discussed in the previous Archive Report (TC)). The presence of rejuvenation flakes and tablets are clues of an in-situ reduction blades cores. Unfortunately we don't have found for this season cores. The blades themselves can however inform us as to the likely form of the cores. The platform would have been plain and orthogonal, probably obtained by the early removal of the large opening flake (the tablets show a rejuvenation of the platform during blade manufacture). Experimentation and the study of archaeological material have shown the existence of different possible blade reduction sequences that provide a high rate of 2-1-2' products, including unidirectional, convergent, divergent or inserted series (Binder and Gassin 1987).

If we consider the complete blades found in the Trench 7, the longest measuring 6.85 cm and 1.25 cm wide (15134.A9), we can imagine cores of around 10-11 cm long. If in turn we consider the morphology of all the blades, especially the smallest, we can evaluate that the core lost half of its mass (length/width) during its reduction. The fact that we have no (obvious) cores is interesting, making us wonder what became of them. Theoretically they could have been reduced and discarded elsewhere on the site. Alternatively it could be that they were broken and reused in a form that essentially masks their original characteristics; we note that some of the pièces esquillées are made on what appear to be core fragments. This seems to be good evidence for the 'recycling' of the nuclei. That said, not all pièces esquillées represent exhausted / reused cores, a number were made on blades (the bipolar scarring occurring on either proximal/distal breaks, or on opposing margins).

From production to use: consumption behaviour

Most of the blade could have been used without modification; indeed many of the plain edges show tiny discontinuous and irregular flakes from use-wear. The most common tools (sensu strictu and sensu latu) are retouched blades and pièces esquillées. The retouched blades are made on both pressure and percussion products; there does not yet seem to be any pattern of choice in terms of which blanks were used to make which tools. While simple linear retouched / backed blades comprise the most common type of retouched blade, end-scrapers, burins and perforators are rare. All the projectiles found thus far come from insecure contexts; they all seem to have been made on blades. They appear to be much less common than on the East Mound and generally seem smaller.

The Çatalhöyük West pièces esquillées can be separated into two subgroups like for those from the East mound, as defined by Conolly (1999: 44): "first consists of pieces with crushing and scarring on one or both sets of opposed ends. The second group is made of irregularly shaped pieces that also show evidence of crushing and scarring, but only on a single edge".

While some were made on cores and blades, as noted above, there are also a number where it is impossible to recognise the nature of the original blank.

Conclusion: economic aspects

The purpose has not been to define in great detail the nature of the different stages of the chaîne opératoire but to define approximately which stages are represented in the obsidian assemblages of the West Mound. Each stage of the chaîne opératoire is composed of characteristic products that we can quantify and illustrate with a histogram (Figure 166). Trench 7 has been sub-divided into three arbitrary phases: 'late grave' (the uppermost levels disturbed by a late grave), 'transition levels' (comprising all the intermediary levels) and the levels from the lowest levels of the deep sondage. The histograms show a similar pattern through time in terms of the various technological groups and technological stages of blade production represented in their constituent assemblages:

- True 'raw material' in terms of cortical debris from the earliest stages of reduction is rare (a very few blades have up to 10% cortical coverage, through this need not relate to the beginning of the production sequence). It thus seems, that as with the East Mound assemblages, the process of decortications / removal of the natural surface occurred at source in Cappadocia as a means of lightening raw material weight transport.
- Evidence for blanks relating to the shaping and preparation of the core is equally rare, with only a single crested blade recorded.
- While the earliest stages of the chaîne opératoire of blade production seem to be largely absent from the West Mound material, the plein débitage is very well represented, particularly for pressure production (with their distinctive 2-1-2' sequence).
- The end of the chaîne opératoire (cores, and core fragments) is not well represented, though some of the pièces esquillées seem to represent a final use / reuse of certain nuclei.
- It is unknown at this early stage as to whether the Trench 5 / 7 material represents the norm for the West Mound, or whether some of these stages of production occurred elsewhere on site.

Geochemical Characterization of the Non-Obsidian Chipped Stone from Çatalhöyük - Brandi Lee MacDonald

Project Summary

The purpose of this project is to explore the nature and distribution of raw material source groups as represented in the non-obsidian chipped stone (NOCS) assemblage at Çatalhöyük through a program of visual and geochemical characterization. The NOCS assemblage consists primarily of chert and chert sub-varieties such as flint and radiolarite. As an expansion of previous work by Doherty and Milić (2007; also see Carter et al. 2007, Doherty et al in press), this project continues a comprehensive program of geochemical characterization of specimens from the NOCS assemblage. The first phase of this research consists of an assessment of geochemical trends of selected NOCS artefacts to determine if enough variability exists to differentiate geochemical groups of chert. Samples selected are currently undergoing geochemical characterization by Instrumental Neutron Activation Analysis (INAA) at the McMaster Nuclear Reactor at McMaster University. Research during the summer 2008 field season consisted of a systematic survey of all NOCS in archived materials from the South and 4004 Areas, plus the West Mound material from the Gibson and Last excavation, together with a more selective review of the North and BACH assemblages. The secondary phase of this research will consist of surveying and sampling of known chert sources around central and south-central Anatolia, as for example the radiolarite beds of the Burhan River Valley in the Antalya region (Pawlikowski 2002). Once the geochemical signatures of chert artefacts and sources are determined, we will be in a position to identify raw material provenance, how the materials were distributed within the region, and their specific techno-typological modes of consumption at Çatalhöyük throughout the occupation sequence, from the Aceramic Neolithic to Early Chalcolithic II.

Previous Research

Doherty and Milić's (2007) work commenced with the NOCS from the site's Aceramic Neolithic Level Pre-XII deposits, material that was divided into potential geochemical/source groups (NOCS Groups 1-23) based on visual characteristics such as colour, lustre, reflectivity, patination, internal features, fracture quality and density. These categories were further reduced to 'source types' based on visual features indicative of the formation processes of the cherts (e.g. lacustrine, marine, deep marine, etc.). These classifications provide the basis for visual characterization of the remainder of the chert assemblage. In addition, Doherty and Milić present preliminary results from SEM-WDS analysis characterizing major element profiles of a minimum of six different chert types. The results indicate several trends in chert geochemistry that are valuable toward determining the chemical profiles of different chert geochemical/source groups (Doherty, Milić and Carter in press).

Regional 'Flint' Sources

The geological landscape of central and south-central Anatolia is highly complex. Geomorphological formations as a result of igneous and metamorphic conditions in and around the Taurus mountain range, and the dissolution of ancient lakes and sea beds, create several different potential pathways toward chert formation. In addition to this multitude of potential pathways to chert formation, the nature of chert sources themselves are variable and can be geochemically heterogeneous. The sources in this area can be discrete, geochemically distinct outcrops, or, can be patchy, discontinuous, spread over an extended range and geochemically inhomogeneous from one end to the other. To determine the physical and geochemical nature of known sources in the region, strategic field and laboratory sampling is critical.

Artefact Sampling and INAA Procedure

The study commenced with a review of the NOCS group types defined by Doherty and Milić. These categories then formed the working basis of describing the various raw materials encountered in those assemblages not studied originally (i.e. everything above and beyond the Aceramic Neolithic Level Pre-XII deposits). Sampling of artefacts was based, in part, on the quantitative results of the visual groups. The variable proportions of NOCS group types and source types across the archaeological assemblage influenced the number of each type selected for geochemical characterization. A detailed description of the sampling rationale based on these results is described below.

INAA is a method where specimens are bombarded with neutrons from a nuclear source. A fraction of the nuclei from each element within the sample is transformed into unstable radioisotopes that decay with characteristic half-lives. These radioisotopes emit gamma ray energies that are characteristic of the isotope. These energies are measured by a HPGe gamma ray spectrometer, directed through an amplifier and are sorted into channels along an electromagnetic spectrum (keV). The peaks that form as a result are the product of qualitative and quantitative signals from elements that produce radioisotopes. The resulting data are bulk quantitative and qualitative elemental concentrations on major, minor and trace and rare earth elements with accuracy to <1ppm in most cases.

One hundred and fifty samples chosen for export were transported to the MNR Centre for Neutron Activation Analysis to undergo geochemical characterization (commencing November 2008). Specimens will be cleaned with distilled H₂O in an ultrasonic cleaner to remove dirt residue and dried in a low temperature oven for 24 hrs. Where necessary, some samples may need to be cut to fit into the proper sample vials. Specimens will then be weighed (preferably to ~1g each) and heat sealed in polyethylene vials.

Two irradiations will be performed on the samples to acquire data on elements that produce short, medium and long-lived isotopes. Data on a total of 30+ elements will be acquired, and a total of seven standard reference materials (SRM) issued by the National Institute for Standards and Technology (NIST) will be run with each batch of material (SRM 1632b Coal, SRM 1633b Fly Ash, SRM 688 Basalt, SRM 278 and Ohio Red Clay). Table 18 is a list of to be elements measured. Those data will then be examined for patterning in elemental profiles and subject to bivariate and discriminant and principal component statistical analyses.

Visual Characterization Results

The following section discusses the results from a visual characterization of the chert and flint assemblage, with a primary focus on deposits in the South Area. The artefacts were examined to determine their source type and group based on criteria outlined by Doherty and Milić (2007 [and Doherty, Milić and Carter in press]). Table 19 lists all contexts where assemblages were examined for their NOCS component by MacDonald in July, 2008.

Table 18: List of elements measured for each procedure

Short-Lived Isotopes	Al, Ba, Br, Ca, Co, Cl, Dy, Eu, Ga, K, La, Mg, Mn, Na, Sm, Ti and V
Long-Lived Isotopes	Au, As, Ba, Br, Ce, Co, Cr, Cs, Eu, Hf, Fe, La, Lu, Na, Nd, Pr, Rb, Sb, Sc, Sm, Tb, Th, Yb and Zn.

Table 19: Levels, areas, buildings and spaces examined to date.

Early Chalcolithic I: spaces 189, 190, 191, 192, 193, 194, 195, 218, 219, 220, 221, 223, 224,	Level VII (4040): Bdgs.40; Bdg. 47, Bdg. 52, Bdg. 60, space 105
Early Chalcolithic II: TR II	Level VIII (South): Bdg.6
Level III-IV (4040): Bdg. 54, spaces 265-266; Bdg.55, spaces 247, 256-258; Bdg.58, space 227	Level IX (South): Bdg.2, Bdg.16
Level IV (4040): Bdg.44; Bdg. 67	Level X (South): Bdg.9; Bdg.18; Bdg.23
Level V (4040): Bdg.56	Level XI (South): space 181
Level V-VI (4040): Bdg.51, space 98	L.XII (South): spaces 181, 199
Level VI (4040): Bdg. 65	Level Pre-XII (South)
Level VI-VIII (North): Bdg. 5	4040 B.45 spaces 228, 238, Bdg. 71 – Levels to be assigned

Distribution of Raw Material Groups based on Visual Characteristics

There is a variability in the distribution of NOCS group types in South Area levels. Preliminary distributional analysis suggests that there is no immediate patterning in the quantity of types between levels. Comparison of these figures with those of the other areas (North, 4040) will be completed in the future.

Preliminary Distributional Summary of Chert and Flint Group Types (South Area)

At each of these levels, the group types grey chert (NOCS 12) and brown chert (NOCS 3) comprise the majority of the NOCS assemblage. The grey chert group makes up between 20-50% of the assemblage at each level, with the exception of Level IV. The brown chert group makes up 10-20% of the assemblage at each level, but falls <10% in levels IX-XII. The next most common groups are the opaque (NOCS 14) and translucent (NOCS 15) cherts. The opaque group makes up between 5-15% of the assemblage at each level, with the exception of Level Pre-XII where it falls to 3%. The translucent group makes up between 0-23% of the assemblage at each level. However, the values for the opaque and translucent groups are

suspicious as a large portion of them are tiny flakes recovered from heavy residue and may actually be part of a different group type.

The radiolarite group (NOCS 8) makes up between 0-11% of the assemblage at any level, but occurs more frequently between levels IX – Level Pre-XII. The flint groups (NOCS 1 grey flint and NOCS 2 brown flint), are less common. The grey flint group is present at 7% at Levels IV and V, is reduced to <1% between Levels VI and XII, then occurs at 10% in the Pre-Level XII sequence. The brown flint remains <2.5% at all levels. The rest of the assemblages consist of variable quantities of NOCS groups 5, 9, 10, 11, 12, 13, 16, 17, 20, 21, and 22.

Sampling Strategy and Rationale

As a consequence of the relative ubiquity of the grey and brown cherts (and their respective sub-groups), the most logical step forward would be to geochemically identify how many source groups are represented within these NOCS group types. Based on visual characteristics, there appears to be several sub-groups within both of these categories that may be indicative of different sources. For example, a number of the grey and brown cherts have potentially diagnostic impurities such as white flecks, or red veins, or orange banding. Doherty's SEM-WDS results suggest that there is little geochemical variability between the major elements in the matrices of the grey and brown flint groups, therefore differentiation may be possible through minor and trace element profiling of these impurities. In addition to the grey and brown chert groups, it would be logical to explore the same issues with the opaque and translucent groups, although in lesser quantity. These two groups also appear to have sub-groups within them based on the presence of impurities such as mottling and black and red veins. Therefore, a sampling strategy similar to that of the grey and brown cherts would be most logical for these.

I systematically sampled from sub-groups within these group types. I took approximately 45 samples from the grey chert group, with each subgroup being represented, and 45 samples from the brown chert group, also with each subgroup being represented. In addition, I took 15 samples from each of the translucent and opaque groups, and 30 miscellaneous samples of radiolarites (NOCS 8), red-brown cherts (NOCS 9), black brown chert (NOCS 16) and black chert (NOCS17). Sampling from these groups will provide several foundations on which to base further geochemical analysis. By assessing the geochemical variability within the grey, brown, opaque and translucent chert groups, we will know how feasible it will be to identify different sources within the most ubiquitous raw material types. If this is successful, we will be able to further refine our typologies in a meaningful way. We will also be able to better understand the geochemical variability in regional sources, despite not yet having source material for comparison. Sampling of the lesser abundant groups (radiolarite, red-brown, black brown, black), will allow us to determine if there are multiple sources of this material, and if further sampling of these groups will be necessary in the future. In total, 150 samples were taken for analysis.

By identifying the number and distribution of all of these source groups we will be able to further refine our visual typologies. Furthermore, these data can be compared to those from geological sources to more precisely pinpoint from where the materials are being procured. With all of these data in place, we will then be able to identify preferences for different materials, the introduction or abandonment of use of specific sources, and the overall distribution of those materials at Çatalhöyük through time and space. If there are patterns in the distributions of raw materials based on their archaeological context (e.g. groups of one type only in association with burials or a particular household), or on the nature of their form (e.g. finished tools, cores, debitage) these may prove to be interesting nuances to the procurement and use of these materials.

Future Research: Source Material Acquisition and Analysis

Collection and analysis of regional source materials will be necessary to pinpoint the precise locations from which the raw materials were procured. As the surface geology of the area is complex, this may prove to be a difficult task. Doherty and Milić (2007), identify potential areas where different source types would most likely occur. One of these is a known radiolarite source north of Antalya (Pawlikowski 2002). Based on geological maps, marine and deep marine flint and chert sources are most likely located strewn along the Taurus

mountain range, south of the Konya plain. Lacustrine chert sources are also most likely located on the southern edge of the Konya Plain a few km south of Çatalhöyük. At the present time we have no source materials to work with, however if when they are acquired a systematic sampling strategy will be employed to adequately characterize the geochemical nature of the sources.

In addition to distributional and geochemical analyses of the raw material groups outlined here, a comparison of source materials and their corresponding tool types would be a useful exercise. If there are patterns in the types of raw materials used to make certain tools, or in their archaeological context (e.g. groups of one material or tool type only in association with burials or with a particular building), these would add a unique dimension to our understanding of the procurement and use of these materials.

Once the distributional and geochemical data are compiled, compared and assessed, we will need to shift our focus from what the patterns are to why they exist. These ideas will be explored through re-contextualization of the chert/flint inventory with other patterns of raw material use at the site. For example, we will compare and contrast any unique patterns we identify with those of others at the site (e.g. special use buildings or spaces, patterns in mortuary ritual, etc) where meaningful and possible. If we are able to tie raw materials to places (sources) in the region, we may be able to identify meaningful connections between people, raw materials and landscape.

Acknowledgments

This research would not be possible without generous fellowship grants from the Centre for Neutron Activation Analysis at the McMaster Nuclear Reactor. Thank you to Tristan Carter, Marina Milić, and Chris Doherty for their advice and support.

Sourcing Studies

Work has continued over the past 12 months on the various characterization programmes that we are involved in, one dedicated to the sourcing of the obsidian from the site, the other to the 'Non-obsidian chipped stone' [NOCS] component, i.e. our various cherts, radiolarites and flint. Good progress has been made on both fronts, with a further suite of analyses having been made at the UC Berkeley Archaeological XRF Laboratory using EDXRF by R. King and M.S. Shackley. In turn, a new collaborative research project on NOCS characterization has been initiated by Ferran Borrell (University of Barcelona) of the Tell Halula and Akarcay Tepe projects, involving T. Carter, M. Milić and C. Doherty from Çatalhöyük and Elizabeth Healey (University of Manchester) from the Domuztepe excavations. The aim of the project is partly methodological / archaeometric, its larger archaeological purpose being to look at large scale regional interaction during the PPN and Early Ceramic Neolithic. An initial meeting was held between Borrell, Carter and Healey at the PPN round table in Manchester, April 2008, with a follow up discussion a few days later between Borrell, Doherty and Healey at the Research Laboratory for Archaeology and the History of Art, Oxford University.

In the summer of 2008 Doherty and Milić were joined on site by Brandi Lee MacDonald, a graduate student of McMaster University (Canada) who under their supervision selected NOCS samples from throughout the East and West mound sequence. This work is discussed in detail above.

Finally, a short paper discussing the significance of the first eastern Anatolian obsidians (from the Bingöl and / or Nemrut Dağ sources) to be found by our team at Çatalhöyük has just been published in *Antiquity* (Carter et al 2008).

Conferences Attended, Papers Presented and Team Publications

During the 2007-08 academic year a number of our team gave presentations at various institutions on our work at Çatalhöyük. In turn, a number of papers dealing with our work have been published since last year.

Conferences

Society for American Archaeology '08, Vancouver, April 2008 – From Sourcing to 'the Social': Re-Humanizing Characterization Studies (T. Carter, M. Milić, G. Holdridge and C. Doherty).

Canadian Archaeological Association '08, Peterborough, May 2008 - From Strontium to The Social? The Intellectual Shortcomings of Obsidian Characterization Studies (T. Carter)

International Society of Archaeometry '08, Sienna, May 2008 - Effects of Technique and Time on the Elemental Analysis of Obsidian (R.G. Hancock and T. Carter).

Talks / seminars

SUNY Buffalo (Institute for European and Mediterranean Archaeology), January 2008 – From Çatalhöyük to Knossos and from Knossos to Kaneš: Relations between Central Anatolia and Crete in the 8th and 2nd millennium BC (T. Carter)

Team Publications

Carter, T. (2007), 'Of blanks and burials: hoarding obsidian at Neolithic Çatalhöyük', in L. Astruc, D. Binder and F. Briois (eds.), *Technical Systems and Near Eastern PPN Communities. Proceedings of the 5th International Workshop*. Fréjus, 2004. Éditions APDCA, Antibes: 343-355.

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Wright, K. and Bains, R. (2007), 'Stone Bead Technology At Çatalhöyük', *Çatalhöyük 2007 Archive Report*. http://www.catalhoyuk.com/downloads/Archive_Report_2007.pdf

Stone Bead Technology at Çatalhöyük - Roseleen Bains and Katherine (Karen) Wright

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Abstract

Since 2006, stone beads at Çatalhöyük have primarily been studied from a technological perspective in which the bead making process, which includes the acquisition of raw materials and the manufacture of stone beads, is closely examined to determine the social significance of stone beads, as related to social and individual identity, trade, adornment and the body, as well as craft specialization. The 2007 field season was very important in further achieving these goals due to the excavation of a possible red limestone bead workshop in Building 75 in the South Area. This represents the first major evidence of an in situ stone bead manufacturing area at Catalhoyuk East; other houses studied thus far have revealed comparatively little evidence for manufacturing (e.g., Wright 2008, in press). Stone bead manufacturing technology is increasingly a focus in Neolithic research; extensive workshops have been documented in Jordan (e.g., Wright et al. 2008 and further references there).

The primary aim of the 2008 field season for stone bead studies was data collection and furthering the research begun in 2006 and 2007 (Wright 2006; Wright and Bains 2007).

During the 2006 and 2007 field seasons, a number of objectives pertaining to the study of stone bead technology were set and followed through into the 2008 field season: (1) adding and supplementing to the stone bead database, newly created in 2006; (2) commencing contextual studies focusing on both production and use contexts of stone beads; (3) studying in detail manufacture marks and drillings of stone beads and any associated micro-artefacts produced during the manufacturing process in order to reconstruct a chaîne opératoire; and (4) determining which tools, from both ground stone and chipped stone assemblages, were used in stone bead production.

(1) This year we made a number of additions to the stone bead database. There were 84 stone beads recorded from the 2008 field season (prior to our departure on the 8th of August), which primarily came from the South Area, however this number does not include the hundreds of roughouts, preforms, finished beads, and debitage flakes found in Building 75. We also added 120 stone beads to the bead database from former years' stone heavy residue. Unfortunately only 2 of these 120 beads were preforms, which contain the most manufacturing information.

(2) Contextual studies are essential in determining possible production contexts which contain traces of bead manufacture from all or some of its stages. Not only can production contexts be identified using contextual studies, but also a bead-making sequence can be produced. In the broader sense, contextual studies can reveal the transition and changes in bead technology during the span of Çatalhöyük's occupation and what these changes mean or suggest with regard to a broader social context.

A diachronic and synchronic sampling strategy for contextual analyses was carefully devised and during the 2007 season only 5 buildings from the South Area were sampled for finished stone beads, preforms, and production debris. This season, stone bead-making materials from the South Area, 4040 Area, and the West Mound, were analyzed, and all materials were photographed and exported to London for elemental and mineralogical analyzes at the Wolfson Archaeological Science Laboratories, Institute of Archaeology, and the Department of Chemistry, UCL, respectively.

(3) Similar to the 2007 field season, stone beads and preforms from sampled contexts were moulded and replicated for close examination under scanning electron microscope for evidence of manufacture marks. Silicone impression material (accurate to the nanometre) was used to create the moulds, which were later filled with epoxy resin hence creating a replica. Examples of specific manufacture mark variables include: hand versus mechanical drilling, perforation type, perforation size, perforation marks, bead face/height marks, bead edges (rounded or sharp).

(4) Ground stone from the sampled areas was also examined and 6 abraders with grooves (primarily made from sandstone or schist) which may have been used for bead production were found, as were a number of nodules (roughly shaped pebbles or stones), and some hand abraders.

A small number of flint drill bits were also found as interpreted by Marina Milić from the Chipped stone team. Moulds of these flint drill bits were also made and the tips of their replicas will be analyzed for use-wear. A number of flint drill bits were also found in Building 75 in association with the red limestone bead workshop.

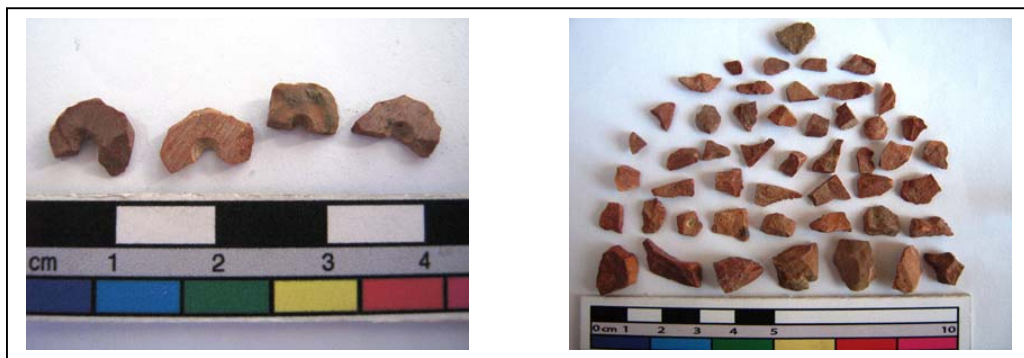


Figure 167: (left) Four performs from Building 75, note abrasion (right) Angular shatter flakes and roughouts from Building 75. Photo Roseleen Bains

Discussion

A general pattern regarding raw material use and bead production was observed during data collection this past season. It appears that the beads found in the earliest occupation of the site (pre-Level XII to Level IX in the South Area) are essentially homogenous. They are tiny circular ring beads made from either pink, white, or beige polishable limestone or dark grey schist. The polishable limestone and schist are locally available raw materials. In the later levels of South Area and 4040 Area (Levels VI to IV), the raw materials become more diverse (e.g., the green bead revolution, see Bar-Yosef Mayer and Porat 2008) and the beads are no longer all simple ring beads. The raw materials used are both local and non-local. Manufacturing techniques also change in order to adapt to the properties of the particular raw material being used. Later in the Chalcolithic period, as exhibited by the West Mound, we see bead technology change once again. The raw materials used once again are predominantly local and more homogenous in shape as in pre-Level XII to Level IX, although manufacturing techniques differ.

Stone bead data collected from the 2006 and 2007 field season, from pre-Level XII, Level X, and Level IX, in the South Area, has been studied in detail. The preliminary results show that the red, white, or beige limestone and dark grey schist beads are all very small ($\leq 2.5\text{mm}$) circular ring beads. The manufacture marks suggest that the beads were drilled biconically, with a mechanical drill using a stone drill bit (bow, strap, or pump drill), and were shaped by abrasion in a group (Bains 2009, in prep). The technical choices made by the Neolithic bead-makers at Çatalhöyük were dependent on both practical and social factors. The degree of standardization, consistent use of the same raw materials and colours, and miniature manufacture all indicate established and socially acceptable methods of manufacture, as seen from the earliest level (pre-Level XII) in the South Area through to Level IX (Bains 2009, in prep). The uniformity expressed in beads suggests a common cultural and communal identity being formulated and expressed through the manufacture and use of stone beads (Bains 2009, in prep). The difficulty in manufacturing beads of such a small size may also reflect a strict adherence to a technological tradition and the time and energy used to make such small beads may have increased the value ascribed to them (Bains 2009, in prep).

The biggest tasks ahead are to analyze the remaining stone beads from the South Area, 4040 Area, and the West Mound. Experimental tools have also been commissioned based on the drill-bits found on site as well as other tool possibilities. Experimental studies are essential to

determine validity of the assessment of manufacture marks and to gain insight into production from the bead-maker's perspective. We are currently collaborating with the Chipped Stone team, particularly in regards to determining different drilling technologies.

What we are looking forward to the 2009 field season to thoroughly examine the contents of Building 75 in the South Area, as the red limestone beads, preforms, and debitage, and flint drill bits, had been discovered just prior to departure. This 'workshop' is the first of its kind at Çatalhöyük and is invaluable at answering some of our key research objectives. This workshop is also the first which may reveal a production context in which beads were shaped and reduced using chipped stone technology as opposed to the reduction by abrasion seen in earlier levels in the South Area described above.

Acknowledgements

We wish to thank the Turkish Antiquities Authority and the Ministry of Culture for permission to export bead fragments and geological samples for testing. Finally, for help in diverse ways we thank Shahina Farid, Ian Hodder, Marina Milić, Milena Vasic, Daniella Bar-Yosef Mayer, Kathryn Twiss, Başak Boz, Mihriban Özbaşaran, Sarah Jones, Tristan Carter, and Jules Cassidy.

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SUPPORT TEAM REPORTS

Catalhöyük IT Archive Report 2008 - Richard May, Sarah Jones

Çatalhöyük Research Project

Abstract

The IT infrastructure was improved this year by some server housekeeping, the purchase of some new equipment and some upgrades. The majority of the database work revolved around improving usability and introducing further data integrity checks. Data cleaning was begun on the excavation database and procedures written to facilitate this further over the winter. As the study season is approaching a lot of time was spent helping team members familiarise themselves with querying the centralised database.

IT Infrastructure

The project was really pleased that Richard May was able to come out to site and set up the IT infrastructure for the project again this year.

On the infrastructure front the usual maintenance work was undertaken on the server and all of the project owned laptops and desktops to attempt to ensure as trouble free a season as possible. Anti virus software was updated on all machines and some data housekeeping done. The network was given a bit of a check over and the wireless devices were updated to try and ensure greater reliability this season. Some work was done on updating the processes to assist in getting people's machines onto the network including providing some better availability to the network for users of Windows Vista. Some updates were made to the anti virus procedure including instructions for using the internet access machine as a gatekeeper to check incoming USB, etc devices for viruses. The team itself was also more aware of virus protection and assisted by bringing their USB equipment into the office for checking before using on site. A number of viruses were detected this way and cleaned before they reached the network.

One of last season's laptops was updated to get properly working with Windows Vista and was then setup (with Jason Quinlan) to house the on site photo library.

Two more laptops were purchased to replace older ones that had to be retired. Unfortunately one of these new Lenovo laptops went wrong within a couple weeks and had to be returned. Some more RAM was ordered and this was added to some of the laptops with the help of Jason Quinlan and Lewis Jones, unfortunately two pieces of RAM were also faulty and had to be returned to the shop. The colour printer had to be replaced this season.

Database Work by Team

Archaeobotany: The team continued to use the database but no further development work was carried out this season apart from the preparation of a read-only local copy for use off line.

Brick: Over the winter Serena Love undertook a lot of work on her brick database and has become one of our more expert database users. Sarah helped to build an interface to display the data and advised on query building where necessary. This continued during the season where we linked in the Heavy Residue data into Serena's system, to do this Serena built some cross tab queries to extract the heavy residue data in the format she required and we then imported the data into her stand alone database. When Serena has finished her PhD this database will be easily imported into the central system due to her co-operation with the design requirements of the project.

Charcoal: Eleni Asouti was present on site this season so we were able to discuss her dataset and how it might be centralised. There was not time to achieve this on site but it is hoped this can happen over the winter.

Chipped Stone: The team continued to use the database but no further development work was carried out this season apart from adding additional runs of bag numbers ready for use.

Conservation: The team continued to use the database but no further development work was carried out this season. It has been noted that for the study season a search facility will be required in this database to help other teams navigate the system more easily.

Clay Balls: Data entry was continued but no development work was undertaken on the clay balls database this season.

Excavation: We undertook some structural changes on the database prior to the season to archive off now redundant fields. This work continued on site to improve some of the post-excavation fields that had been added over the years but which were proving confusing due to inconsistent usage. We also needed to make the status of a unit clearer so that lab teams querying the database could more easily understand the data they were viewing, for instance why some units had no Space and therefore Level information.

An example of one of the structural changes involved the phase field that had been used to store a variety of types of information, it was renamed to 'Phase In Building' as this was its original purpose and the additional information moved to either the new field 'Time Period' (Neolithic, Chalcolithic, Post-Chalcolithic) or 'Excavation Status' (Excavated, Not Excavated, Unstratified, Void, Natural). Our data cleaning also concentrated on identifying missing units, cleaning date fields and ensuring data integrity. We also added the Foundation Trench information to the database.

A number of routines were scripted to help the data cleaning work. These routines check the integrity of the relationships between Buildings, Spaces, Features and Units. The cleaning work on the excavation database is on going.

Faunal: The faunal database continues to work well and this season we concentrated on improving usability based on a list of suggestions made by Rissa Russell. In addition a number of data exports were prepared to allow off line read-only use of the data.

Figurines: Major work was undertaken on the figurines database this season. Although the figurines data has been available in the central database since 2006 this was a read-only copy and the team were still using their local FileMaker Pro (FMP) file to keep the database up to date, the data was then periodically uploaded to the central database.

Prior to the season the FMP interface was altered to link it directly to the data uploaded into SQL Server. This was possible due to the new version of FMP (9) supporting an ODBC link to SQL Server. This was the quickest way to give the team an interface on the centralised data as they had already created their own interface. This method of data storage and entry allowed multiple team members to update and view the data at the same time, which had not been possible before.

Work had to be undertaken to normalise the data to suit a relational database rather than the repeating field legacy still supported by FileMaker and the interface had to be altered to support this new structure. Also the images previously embedded in the FileMaker file had to be exported and held centrally so they could be viewed by multiple users.

An important requirement of the team was to have a read-only local copy of their data that they could carry around off-site. A script was written to download the latest data from the central database into a local FMP file, including the images. This can be run at any time to ensure the users always take away the latest copy.

This was the first time we had attempted a FMP interface on the centralised database and we viewed it very much as an experiment. We did encounter some teething problems. Carrie Nakamura spent a lot of time sorting out image names and converting image files to standard formats so they could be viewed and downloaded successfully into the local copy. Lynn Meskell's copy of the interface had problems viewing the images at the beginning of the season but this sorted itself out later on. This might have been a network speed problem.

The work this season has enabled the team to input data directly into the centralised database and to take away a read only copy. There is still more work to carry out on the structure of the database, the way the interface presents pull down lists and how the interface can offer data entry shortcuts. Also we are still resolving issues with FMP's connectivity to the central database off-site and assessing its feasibility.

Many thanks to the team for their patience this season getting the system up and running.

Finds: Work continued on the Finds database throughout the season with Julie Cassidy's valuable input on how to improve the recording strategy. The integrity of the x finds data and the crate register were checked and features put in place to ensure future records are tallied between the two forms. New search facilities were added on each form to improve information retrieval. The crate register form was redesigned to allow vertical tabbing as well as horizontal tabbing, a feature that allowed Julie to enter large quantities of data much faster. A number of other small changes were made to the interfaces to help data entry and to ensure future data integrity.

GIS: Thanks to the work done by Jonnie Godfrey over the winter Cordelia Hall and Sarah were able to experiment with the possibilities of using ArcGIS to present the Catal data. We were able to connect directly to the central database and produced various presentations of data from different teams datasets. By the end of the season we had produced a demonstration system that can be used as the basis for further work off-site.

Heavy Residue: Slight tweaks were made to the Heavy Residue database this season including further checks on the integrity of the data being entered in relation to the archaeobots database. A number of queries were also created to help Betsa Vasic check over the existing data.

Human Remains: Simon Hillson and the team finalised the features of the first phase of the Human Remains database development and tested its use this season. Simon created a paper form based on the database recording system and the team used this to record all the data from previous years, a major task. This data can now be entered into the database during the winter.

Photos: Jason Quinlan and Sarah continued their collaboration to integrate the Portfolio system with the central database. Rich setup up the necessary software for us to run the catalog from a separate laptop which we used as the Portfolio server enabling the photos to be held in a single catalog this year. The code that linked the web site and the MS Access interfaces that showed photos needed to be changed to reflect the single catalog. We worked on streamlining the metadata attached to photos and exporting the necessary information from the central database into Portfolio.

Pottery: A lot of work was undertaken with both the East and West mound pottery teams to define the requirements for the improved pottery database. The most important aspects were defining the overlap in the recording systems between the two mounds as well as their differences to build a system whereby both can work side by side. The underlying data structure was defined and created and the interface development was started by way of a handwritten storyboard. By the very end of the season the beginnings of the MS Access interface had been developed. This work must continue over the winter to ensure the new system is up and running by next season.

Shell: A completely new database was created this season to help new team members Danny Bar-Yosef and Burcu Gümüş in recording their Shell analysis data. The database was based upon Danny's tried and tested recording methodology usually entered into MS Excel. An MS Access interface was created allowing data entry by unit, which linked in the unit information from the Excavation database. We evolved the database through a number of iterations and hope to continue this work next season.

Querying

A lot of time was spent showing various team members how to query the central database. This is a vital task with the study season approaching and was a high priority this summer. To cater for different levels of experience and requirements sessions were either held for small groups or for individuals. MS Access provided the ideal tool for this teaching with its easy to learn query interface allowing even the least confident team members to soon realise that database querying was well within their abilities.

Teams that were particularly active with querying this season were Human Remains, Figurines, Shell, Archaeobots and also Ian.

It became apparent that by next season we will need to have a database table guide to help users define which tables and fields they require to use in their queries, plus some short querying guides to help answer common questions. Each of these has been talked about in previous seasons but nothing concrete has yet been produced.

Data On-line via the Web

Prior to the season starting some further work was undertaken to improve the presentation of the data on-line. The link to the Portfolio catalog held in Stanford was achieved and the concept of a 'reference' photo introduced. Wherever possible a photo is displayed on every excavation page (if a link has been made via the metadata). A number of 'hot-spot' plans of buildings and spaces were also added to enable users to click on the image to view the related record, plus some matrixes were made available.

Conclusion

It is testament to the work of all the teams that the databases are now running smoothly. The majority of this seasons tasks were to tweak them to improve usability. Each season we are discovering more ways to integrate datasets and reduce duplication, this is mainly borne out of the growing the confidence of the users to see how being able to draw in other teams data can reduce their work load and cut down on errors.

The increased onus on query training is vital with the study season coming up. Again, it is the increased confidence of the team members that has allowed this process to start. Some useful information has been gathered in how each team wishes to use the data and where training resources should be focused, the individual and small group sessions were particularly successful.

The major data cleaning exercise concentrated on this year will continue throughout the winter and is greatly helped by team members using the data and highlighting issues.

The study season will see some intense database usage and hopefully provide many suggestions and ideas for how the system can be improved in the future.

Finds Lab Archive Report 2008 - Julie Cassidy

Çatalhöyük Research Project

Archaeological excavation is inherently a destructive process. In order to understand the stratigraphy and structure of a society, we must remove one layer to investigate the layers below. Therefore, aspects and stages of the excavation process must be accurately recorded, preserved and archived for future study.

The role that the material culture plays in this process is vital and cannot be underestimated. Artefacts can date or interpret a space or building. New technologies and research may develop which will enable us to interpret the material much better in the future than we can today. We therefore have a responsibility to preserve the past for future generations.

The primary responsibility of the Finds Manager at Çatalhöyük is to assess the condition of and to accurately record the material culture uncovered by the excavation in order that it can be accessed, studied and interpreted by a range of specialists far into the future. In addition to

this, the Finds Manager is responsible for the security and safe storage of all artefacts, according to Çatalhöyük's status as a site of international importance.

2008 Season

The 2008 season at Çatalhöyük produced artefacts ranging from clay balls, pottery and both worked and unworked stones to figurines, beads and bone tools. Over 1600 of these artefacts were recorded as X-finds (see below).

The finds this year bring the total number of crates, or storage locations, to over 1000. To store these crates, two new Finds Depots were built at the rear of the Dig House. These depots make access to crates and the control of the storage environment much easier than in previous years.

In addition to identifying, processing, and recording the current season's finds, the finds integration and recording of previous seasons artefacts was continued following the work initiated in 2005. The database cleaning process was also continued in preparation for the upcoming study seasons.

Finds System and Processing

Çatalhöyük is almost unique in that the majority of specialists and conservators are on site during the excavation, and so identification, condition assessment and full recording is an ongoing process that takes place during the season, rather than, as at many sites around the world, months later during the post-excavation period. It is the responsibility of the Finds Manager to ensure the fast and efficient flow of material from site to specialist so that feedback can be given.

Wherever possible, materials and processes used comply with the accepted UK archive and museum standards of storage, recording and conservation. It should always be remembered that the archive we collect now will be in use for many years to come, and we need to ensure that the integrity and condition of the finds is not compromised.

All teams bring finds down from site at the end of the working day, and those finds which are able to withstand washing are separated from those which are too fragile or may have residues which may need to be preserved, e.g., groundstone is not washed as it may have been used to grind pigments. X finds are also separated so they can be recorded on the Finds Sheet within the database (see below). Once a week, ladies from the local village of Kücükköy wash the finds and when dry, they are re-bagged and distributed among the specialists present on site. Those finds without a specialist on site are crated up and an inventory made. Each crate has a number and each unit and x-find within that crate should be listed on the Finds Register database.

Unit details are always written on Tyvek labels in Black, waterproof *Sharpie* to limit the fading of the ink over time. Archive samples are kept in acid-free envelopes and are written on in Black biro. Large plastic crates are used to store the artefacts according to material within the Finds Depots, with care taken when packing the crates so that finds are not damaged. Acid-free tissue paper is used to package the smaller, more fragile finds inside size appropriate crystal boxes. For the more fragile, fragmentary artefacts, the Conservation Team is on hand to offer advice.

X-Finds

An X-find is one that the excavator deems valuable in terms of its position on site. Finds located on room floors, for example, or within bins, can enable us to interpret and date the space much better than when finds are absent. Therefore, a prefix of 'X' is used to distinguish the find from others, and a 3-D measurement is taken to locate its exact find spot.

The X-find system should not be used as a copy of the archaic "small finds" system, still used in much of the world, whereby a special number is given to finds considered nice or special. An X-find should be some thing found in a place that has significance and can be located within a space. Dry-sieved finds should not be given an X number, as they cannot be

accurately located and are usually part of room fill, and so cannot be used to interpret the space.

What excavators select as an X-find is not always consistent, i.e., figurines and beads are not always selected as X-finds. The category is dependent on where the artefact is found, not on what the artefact is. It is for this reason that each specialist team on site is also given its own indicator letter, so that any find without the X prefix can be singled out for discussion within a report if it is of particular interest, i.e., a figurine not given an X prefix on site is given an H prefix by the figurine team.

Each X-find is recorded separately on the Finds Register. A direct link to the Unit sheet shows what the excavators believe the X-finds are, and this often leads to an interesting development of information and interpretation. For example, something that is identified as faunal bone on site may be re-identified as shaped clay in the Finds Lab. The figurine specialist may then further re-interpret it as an Abbreviated Humanoid Figurine.

Database - Future Developments

The role of Finds Manager at Çatalhöyük is seasonal and therefore a number of Finds Managers over the course of the excavations have imposed their own views on how the system should be run (See Finds Archive Report 2006). One of the aims for this season was to continue the development of a finds system that is simple to use and logical and effective in terms of the results produced. It is recommended that the system be followed and the crate integration process be continued by future Managers.

Full database integration across disciplines and teams will enable the full study and cross-discipline research of all aspects of Çatalhöyük life and material culture, particularly important for the upcoming study seasons. Research topics involving the study of grave goods, food consumption and production, trade and bead production, to name a few examples, all require full access to cross-discipline data. It is equally important in cases where the specialists, for any reason, may not be present during the season to offer advice. Their basic data should be accessible to other researchers on site.

The Finds Manager should continue work closely with the IT team, Lab Leaders and researchers to create a fully integrated, fully searchable, easily accessible finds system that will enable the archive at Çatalhöyük to be used many years into the future.

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Heavy Residue Archive Report 2008 – Milena (Betsa) Vasic

Çatalhöyük Research Project

Heavy Residue Database

As all of the project site databases the Central Heavy Residue database uses Microsoft Access. The Interface of Heavy Residue database was created to resemble the Heavy Residue sheet. Therefore, entering the data in HR database is based on copying the data from the HR sheets. First of all, when a new HR form is created, details about a particular sample are entered: Unit number, Sample number, Flot number, Flot Volume, date when the sample was sorted and initials of a HR analyst in charge respectively. Each floatation sample has unique record with details about all materials found in a sample. This data is entered in a sub form that is consisted of rows in which each material should be entered and columns with percentages of processed fractions and weights for each material that is found in a particular fraction.

During the season 2008 some minor changes have been made. Rounding of numbers for percentages for 2 mm and 1mm fractions was abolished. Therefore it is now possible to enter 12.5 % for these two fractions, instead of 13 % as it was before.

Since it was decided for one fragment of building material, that was not painted, to be kept, category "other" was added to the list of materials.

The most important change of the HR database that was made in 2008, was establishing auto match of gid numbers with Botany central database. Since botanists are always the first who enter the floatation data into the database, this auto check is very useful. It allows us to spot and check the Unit number, Sample number and Flot number as soon as we enter them in HR database. That way it is much easier to correct the possible mistakes that can easily occur while processing each sample.

Some steps have already been taken concerning the integration of Heavy Residue database to all databases. For example, it was decided that the Volume is not to be entered by Heavy Residue analyst. Given that botany specialists are always ahead with data entries, the Heavy Residue database for the entered flot number, automatically pulls the Volume data from their database. As Heavy Residue material is weighed on approximate basis, it is more precise to use the weight data from specialists. It has been agreed for the weights to be copied manually from other databases such as Lithics, Faunal or Ceramics into Heavy Residue database. That way, Heavy Residue database will contain accurate weights of materials.

Conservation - Duygu Çamurcuoğlu

Team: Liz Pye*, Duygu Çamurcuoğlu*, Nancy Shippen*, Kelly Caldwell*, Alanna Wakeford*, Sengül Arslan (1)

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Abstract

Site and artefacts conservation was successfully carried out during the 2008 excavation season in collaboration with the conservation students from the Institute of Archaeology-UCL, Mimar Sinan University and excavation/laboratory teams. The main activities of the season were the re-opening and conservation of the Building 5, the conservation of features in the Building 52 and in the newly excavated Building 77, the lifting of the decorated wall in the TP area, the conservation and reconstruction of Neolithic pottery, faunal and human bones as well as other small finds. In addition to these, some architectural features and plastered walls were conserved as needed.

Research into particular on-site conservation problems were also carried out in order to find the most suitable solutions.

Excavation and treatment of fragile and complex materials

In the 2008 season, the conservation team undertook the most complex and heavy lifts of the last five seasons: The wall border with a spiral motif decoration, which surrounded three walls of a small room in the TP Area (Building 74, Space 327), found during the 2007 season (Figure 168). The spiral motif decoration was incised on mud plaster, which was applied on the surface of the mudbrick walls which was eroded in places. After being consolidated and a mould taken (see 2007 Archive Report), the mud plaster border was covered with Geotextile (permeable fabric made of polypropylene), soft perlite bags and sand bags, until it could be lifted during the 2008 season.

This season, Space 327 was re-opened and the conservation team continued to work on the decorative border (only the middle section as discussed) to prepare it for the lifting process. Apart from reducing the thickness of the back of the main wall where the border was placed, it was decided that approx. 7 cm of the wall from above and below the border should also be lifted in order to minimize the damage that might occur during lifting.



Figure 168: Decorative border with the spiral motif.

Before thinning the back of the wall (up to approx. 10 cm), the surface of the border and the wall in general was supported by placing layers of geotextile and plastazote (closed cell polyethene) propped with sand buckets and bags to prevent the wall from collapsing during the process. Following this, the back of the wall as well as the top and the bottom parts of the border were consolidated with 50% Primal AC-33 (acrylic emulsion) in distilled water in many applications which made the wall strong enough to withstand the lifting process. Once the wall was fully stabilised, the support material was removed and the border was cut with some of the mudbrick below by using a variety of saws. As the bordered part separated from the rest of the wall, it was placed onto a custom made board with geotextile and plastazote supports and with the help of local workmen, it was carried to the conservation laboratory in order for further work to be undertaken during the 2009 season (Figure 169).



Figure 169: Lifting the decorative border.

The Conservation of Features in the Building 52 and Building 77

A significant discovery in the 2005 season was the first complete Bucrania found during the excavations of Building 52 in the 4040 Area. Since this was a remarkable find, it was decided that it should be preserved in situ and put on display when the 4040 area was covered with a protective shelter. In the mean time, the Bucrania was protected by reburial in a bespoke wooden box (see 2005 Archive Report).

This season, with the completion of the new shelter over the 4040 Area, the Bucrania and the horn cores needed to be fully conserved and prepared for in situ display (Figure 170 - left). The work mainly included the consolidation of the lightly plastered Bucranium, the horn cores and the surrounding plastered walls/bins, by using either 25 or 50% Primal AC-33 (acrylic emulsion) in pure water according to the strength needed. For the stabilisation of the cracks, a mixture of glass microballoons and 40% Paraloid B72 (ethyl methyl methacrylate) in Acetone was used as a filler, followed by colouring with acrylic paints. For the plastered walls, lime based mortars and grouts (see 2006 Archive Report) were used to stabilise cracks and voids (Figure 170 - right).



A newly excavated Building 77 is located in the centre of the 4040 Shelter. There was evidence of heavy burning and the fire preserved some of the in situ features. One of the most significant features of the building was the two plastered pillars attached with large cattle horn cores on both sides, placed on a platform in the north east part of the building. Also right above the pillars, on the north wall, there was a sheep head, moulded in plaster. Since the whole building was going to be displayed in situ, all the features inside needed to be conserved.

Like in the Building 52, the horn cores and the plastered features were stabilised with 25 % Primal AC-33 (acrylic emulsion) in pure water. The cracks on the horn cores were filled with the mixture of glass microballoons and 40% Paraloid B72 (ethyl methyl methacrylate) in Acetone and coloured with acrylic paints (Figure 171 - left). During the excavation of the pillars, the soil that was beneath the horn cores was left intact in order to provide a physical support. However it was decided that using soil as a support material might be risky in a longer term (i.e. the risk of erosion) to display the horn cores in situ and after discussion it was agreed that a support mechanism made of Perspex (polymethylmethacrylate) would be placed underneath the horn cores to provide a better support.



The Perspex sheets were provided by an Istanbul based conservation company and installed by Ahmet Demirtas. The Perspex was cut according to the exact height between the horn cores and the platform. For each horn core, three perspex props were used, as their weight and stability were carefully evaluated during the process. The props were attached to the horn cores by using a silicon gun and masking tape pieces as a barrier layer (Figure 171 - right). The condition of the horn cores and the stability of the perspex feet will be regularly monitored in order to prevent any unexpected damages.

Conservation of small finds

Work on a variety of finds excavated in the field (horn cores and other animal bones, human bones, pottery, clay, metal, glass) was undertaken on the site throughout the 2008 season. Like the previous years, a number of Neolithic pottery was conserved and reconstructed in order to understand the original forms and evidence of use.

Two important finds of the season was a clay stamp seal in the form of a hand and a copper sheet necklace wrapped around a woven fibre, found as a burial good together with some shell beads.

Hand motif is commonly seen on Catalhoyuk wall paintings, but this was the first time that it was found as an object. The seal was in a good condition and only cleaned for further study/display (see Figure 153). The copper necklace was a part of a baby skeleton, which was buried under the northern platform of the Building 49 (Woven & Twisted Fibre, this report). It was found around the neck area with a line of shell beads and the remains of an organic (dark brownish) deposit. It is possible that this organic deposit might be an evidence of very degraded leather and a detailed microscopic study is required to clarify the nature of the deposit and of the woven fibre. Since it was found at the end of the 2008 season, the copper necklace and the beads were consolidated and temporarily packed in order to undertake further work in the 2009 season.

Conservation Research Projects

Re-opening of the Building 5 - Kelly Caldwell

This season, with the completion of the new shelter, one of the focuses for the conservation team was to reopen Building 5 now incorporated in the 4040 Area. Building 5 was reburied during the 2007 season as one of the multiple preparation stages for the construction of the new shelter construction, which covers part of the east mound on the north side. (see 2007 Archive Report for specifics of the reburial process)

Reopening work commenced with local workmen removing the large sand bags filling the most of the building. Once the sand bags were cleared and the members of the conservation team were able to gain access to the interior of the building. We began by removing the loose soil in and around the bins and pits, which are mainly located in the corners of each of the spaces.

Working from the corners inwards, the remainder of loose soil was removed with the help of workmen, along with the geotextile. This work was completed in one day. The small sand bags which supported niche (F.267) were left in place until the building dried and settled.

After the removal of the geotextile it was apparent that damage has occurred over the past year (Figure 172). Several areas have cracked further and at least 50% of the building was damp. Unfortunately, during the removal of the large sand bags a section of plaster on the wall F.229, dividing Space 154 and Space 155, was damaged. Most of the plaster sections were retained for further conservation. The dampness of the building mainly was occurring on the south and north walls. These walls have always been areas of concern since the erection of the Building 5 tent. Drainage of this shelter affected these two areas by creating a consistent source of moisture. The floors in each of the spaces were damp due to groundwater and trapped moisture from the in-fill. The post retrieval pits which were on the east side of the Space 154, were extremely damp, causing the fill dirt to become compacted in these areas.



Figure 172: Building 5, facing West. Note the differentiation in colour between the walls and floor. The darker areas are still damp.

The remainder of the conservation efforts in reopening the Building 5 involved the examination and treatment of the exposed structures (Figure 173). After evaluating the condition on the first two days of the project, it was decided to continue with the previous approach to treat the damaged structure. Primal AC-33 (acrylic emulsion), diluted to 25% and 50% in pure water, was used to treat the cracked and exfoliated surfaces. 50% Primal AC-33 in pure water was used by injecting the solution into the cracks of the walls with a syringe (Figure 174). The walls were further consolidated by spraying 25% Primal AC-33 onto the surface. Once dry, areas of more extensive damage were mortared to provide better cohesion between the plaster and the mud brick substrate. The mortar used was a three part dry mixture consisting of 1 part lime, 1 part brown sand and 1 part dry residue from flotation (see 2006 Archive Report). This dry mixture was then mixed with 50% Primal AC-33 in pure water to a working consistency and applied to the damaged areas with the use of a spatula. After the mortaring process, these areas were toned down in appearance by using diluted acrylic paints and the fill material.



Figure 173: Conserving the bins in Building 5



Figure 174: Conserving the oven in Building 5

During the consolidation of the walls, a film of old consolidant (Primal AC-33) and salt deposits were noticed on the north and south wall of Space 154/155, which were causing the outer most layers of plaster to exfoliate from the surface. The damage varied from 1mm-10mm. It was discovered that due to the drying of these two walls, salts were being trapped behind the old consolidant and thus causing damage. Rather than relaying these sections, it was decided to peel off this film to remove the

salt deposits and allow for better evaporation of water from the walls. This process spurred a future research project involving sample collection (see below).

As a continuation of the extensive documentation that has occurred during the main stages of Building 5, a moderate condition survey was completed to show variants between seasons. This year was imperative in order to see how the building will react to being reopened under the new shelter. The full extent of the issues at hand will need to be further examined next season to see what course the building has taken. Even though the previous surveys showed condition through documented Photoshop images and keys to interpret some of the information, it was decided that our documentation would be simplifying condition reports combined with final photo documentation of each of the wall and features within the building. (See the Photo Catalogue for Final Photos)

Investigation of Salts within the Building 5

Due to the overall dampness of the certain areas within the Building 5, the care was taken in monitoring these areas for the appearance of cracks during the drying process. In order for maximum penetration of the consolidant through the wall, the wall needs to be dry. Problems occur if the wall has not completely dried prior to the application of the consolidant. Salts within the structure of the walls become trapped by the consolidant, creating a film on the surface of the mud brick and plaster. Even though the salts are insoluble, due to the coating of Primal AC-33, the salts cannot be brushed from the surface.

Because of the consistent drainage problems occurred during the life of the Building 5 tent, the north and south walls of the Building 5 were not dry prior to some previous application of the consolidant. The consolidant then created a barrier, which prohibited the salts to effloresce on the surface. Thus, a test area was allocated to determine the best approach to treating this kind of problem. On the south wall (F.244) of Space 154, the niche (F.245) a grid was made of four quadrants; from left to right 1 and 2 with 3 and 4 below. Each were cleaned and treated with a different approach. The overall goal of this is to see how the different quadrants weather, helping conservators decide what is the best treatment options.

- q.1: cleaned only- removing the Primal AC-33 film
- q.2: uncleaned- sprayed with 25% Primal AC-33 v/v in pure water
- q.3: cleaned- sprayed with 25% Primal AC-33 v/v in pure water
- q.4: uncleaned- injected with 50% Primal AC-33 v/v in pure water, relaying loose sections (Figure 175)



Figure 175: Building 5, F.245 in south wall (F.244). Photo Kelly Caldwell

The samples of salt and Primal AC-33 film were also taken. Four samples were taken by scraping the film using a scalpel and storing it in a plastic test tube for transport. A section of the niche was also taken to examine the depth of the Primal into the plaster layers. These

samples will be analytically tested to determine the types or type of salt present, but predominantly to determine the effectiveness of the consolidant on this type of structure.

Other conservation projects (Duygu Çamurcuoğlu)

Environmental Monitoring project

We downloaded the data from the dataloggers, which had been placed in Building 5 and Building 17 (South Shelter) during the 2006 season in order to monitor the RH (Relative Humidity) and temperature for a year.

From the readings, it is clear that the protective tent which used to cover the Building 5 before the North Shelter was built, presented a usual RH and a temperature pattern with regular fluctuations during the year.

In winter, the tent was kept closed and the RH went up to 80% inside the building whilst the temperature dropped down to -8 CO. Due to the drainage problem around the tent, the water that was gathered from rain/melt snow etc., was absorbed by the surrounding soil through the building. This caused extensive dampness at the bottom of the building and together with the effects of the ground water, resulted severe delamination of the plastered surfaces/walls. With the ventilation of the tent during the summer months, the RH went down to 19% whilst the temperature rose up to 35 CO. The dampness within the building slowly dried out. Even though this pattern is inevitable given the circumstances of the site, this seasonal change caused constant instability of the plastered and mud brick surfaces which should be regularly monitored and conserved.

Inside the South Shelter, we observe the similar RH and temperature pattern differing between the winter and summer months due to the side panels being installed and de-installed. In winter, the RH rises above 90% whilst in the summer decreases down to 18%. Like the Building 5, the similar effects occur on the plastered/mudbrick surfaces within the South Shelter and they need to be monitored and conserved regularly.

With the erection of the new shelter over the 4040 area, a significant environmental change occurred inside the Building 5. Like the South shelter, the side panels of the 4040 shelter are planned to be opened during the summer months and closed in winter. However, this situation is very likely to cause sudden changes in RH and temperature levels, and further fluctuations that would accelerate the deterioration process inside the shelter. Due to this reason, it is recommended that the side panels of the 4040 shelter would not be removed for the next three years when no excavation work will be undertaken during the study season.

Also, this season, dataloggers were placed in Building 5, 55 and 77 in the 4040 area to observe the fluctuations of RH and temperature inside the new shelter. The data will be collected and evaluated during the 2009 season.

Documentation of conservation

The development of the conservation database has continued throughout the season as we collaborated with the Database team and achieved very efficient results. All artefacts were photographed before, during, after treatment and registered to the new image catalogue in order to be linked into the recently developed Çatalhöyük Conservation database.

Reflexive Conservation

We continued working with local women in the painstakingly slow and careful job of revealing paint layers on selected plastered walls in the 4040 Area. With experience and familiarity that the local team gained in the previous years, they were able to work independently and seek for supervision when necessary. Their good work revealed an extensive wall painting on the north wall of the Building 55 with very distinctive, red painted hand motives (Figure 176).



Figure 176: Wall painting in Building 55

Acknowledgements

We are indebted to Ahmet Demirtas for sharing his conservation skills and expertise in the use of perspex as mounts for archaeological materials. The perspex mounts for the horncores in B.77 have indeed made a wonderful feature look even better. We are looking forward to a similar approach for the bucrania in B.52. Thank you again for your time and materials.

Big thanks to all team members who made 2008 a very successful season. Special thanks to Nurcan Yalman for helping with the lifting of the decorated wall border in the TP Area.

RESEARCH PROJECT REPORTS

Clay-Based Materials Report - Chris Doherty and Estelle Camizuli

Oxford Research Laboratory for Archaeology

Characterisation, technology and provenance studies continued on all clay-based materials with a particular emphasis on identifying common fabrics and matching these with material from the coring program. After three seasons of observation on both artefacts and sediments, a clear model is emerging of what clay resources were initially available, how these would have developed throughout occupation, and what potentials these offered to the occupants. The connecting thread here has been the use of petrographic analysis to look across the artefact boundaries, as this year's research projects.

Figurines

The figurines present particular difficulties for petrographic analysis, as this has to be non-destructive. To work within this limitation, it has first been necessary to develop a good understanding of the local geology, which has been pursued through the coring work of the last two seasons. We now have a good understanding of the various clays around the site, and can start to make a comparison with the figurine fabrics. A fully comprehensive figurine survey of this type is planned for 2009 but observations to date indicate that:

1. a range of fabrics are represented which, in general, tend to be finer and more clay-rich than those of other clay artefacts. This is consistent with the demands of these relatively small forms to cope with high curvatures across relatively small diameters.
2. none of the figurine clays are tempered, all are naturally fine sediments.
3. both contemporary alluvial clays and the underlying Pleistocene lacustrine sediments were used, both being procured in the immediate vicinity of the mounds.
4. the figurines have not been fired to pottery-making temperatures, although some do appear to have been hardened through heat.

Figure 177 shows the wide range of materials, which have been used for figurines. 1a is a small horn made from fine silty clay with very few coarse inclusions. The high plasticity of this smectitic clay allows small forms to be moulded in detail without shrinkage damage. Both this and 1b have been made of clays the Lower Alluvium unit (Boyer et al., 2006) which was accumulating at the base of the east mound from the onset of occupation.

The surface of 1b is less smooth due to small pores corresponding to the rootlets of plants which were growing in the alluvial soil, and the animal figure of 1c has a still rougher execution due to marl inclusions and shrinkage of the smectite-rich clay matrix. The 1c material has also been sourced from the contemporary Lower Alluvium unit, but from a better-drained area than that of 1a and 1b (e.g. such as those areas shown by coring to lack a basal black "organic" clay).

The skeletal figure (1d) is made of a fine alluvial silt, of the type seen most widely in the Upper Alluvium. This also lacks coarse inclusions, but fine grains of dark biotite and amphibole are conspicuous against the buff matrix and confirm that this is local (Çarsamba-May) alluvium. With a much reduced clay content, this figure does not show disruption of its surface by excessive shrinkage. The white colour of 1e is due to this having been made of pure marl, and the figure has been carved rather than moulded. A non-white marl has been used for 1f. Fine sand grains (quartz, feldspar, amphibole, chert) give a rougher surface than for 1e, with shrinkage again due to the high (smectite) clay content. The pinkish colour suggests either heating above an estimated 200-300 degrees centigrade, or that the clay has been coloured with a small amount ochre or red clay impurities. Both 1e and 1f have been sourced from the Pleistocene lacustrine sediments which underlay the site.

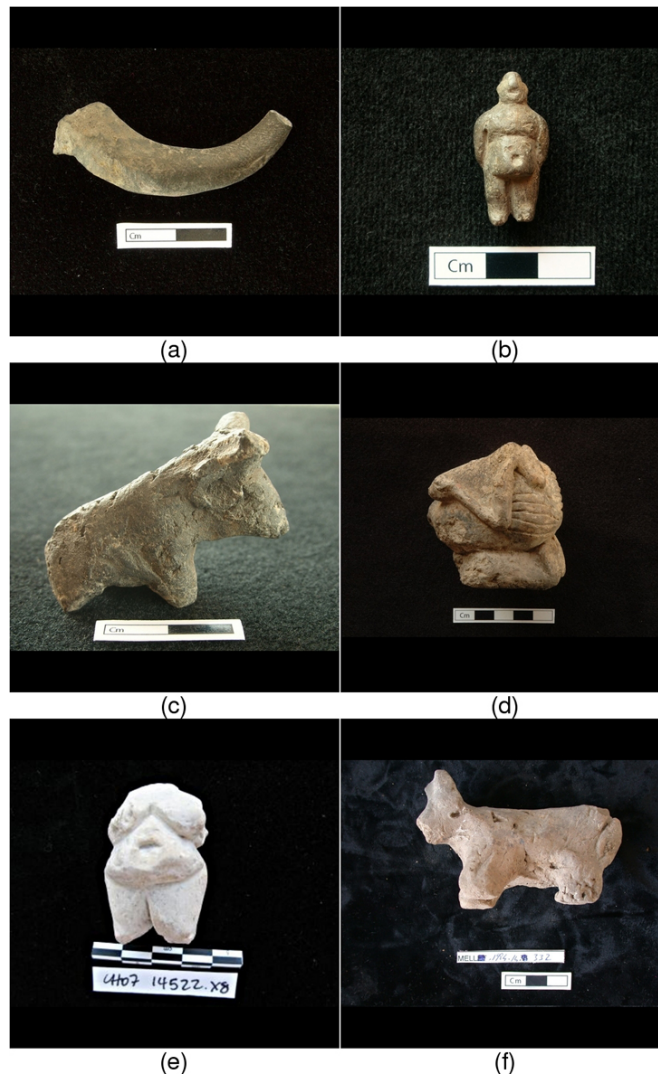


Figure 177: A wide range of materials in used for making figurines.

Clay Balls

A visual inspection of several clay ball fabrics during 2007 (see 2007 Archive Report) suggested that these may not be made from tempered clay, but are natural silty sediments, which were variably reworked or shaped. For example, the split clay ball in figure 2a has the relict parallel bedding running from top right to lower left, and has clearly not been homogenised by forming. Similarly, the polygonal internal fracture patterns seen in many clay balls (Figure 178) are recognised to have been inherited from the prismatic structure developed in the sediment due to clay shrinkage.

This year, Sonya Atalay kindly made available a series of thin sections of clay balls, which will allow direct comparisons to be made with the fabrics of pottery thin sections. From this it will be possible to establish how the use of clay changed as pottery replaced clay balls for cooking. In 2009 we intend to undertake some limited experimental work on site to determine the requirements for efficient cooking with clay balls and the degree to which these were met by the selected clays.

A preliminary examination of these thin sections (figure 2c-2f) confirms that the clay balls were made from natural clayey silts, and that they were not tempered. Figures 2c and 2d show that there is some variation in the clay: inclusion ratio, but this is natural and is also seen in the silty clays recovered by coring. The tightly packed inclusions give better heat

storage/transfer properties than would be the case for a more clay-rich material. This explains why these materials would be efficient as heated "stones" for cooking.

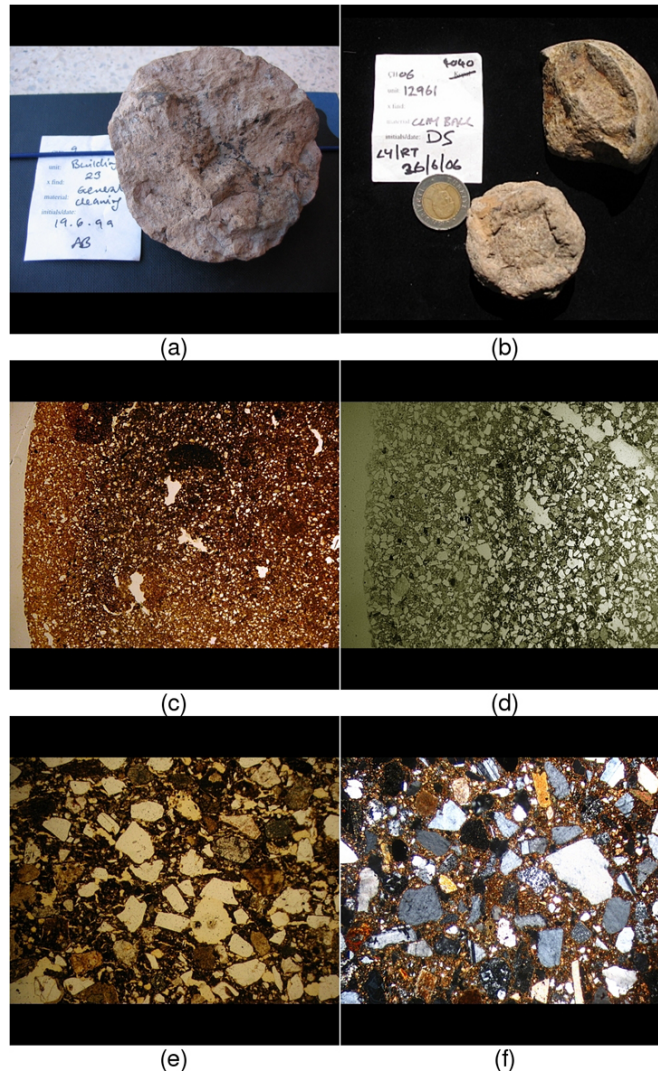


Figure 178: The polygonal internal fracture patterns seen in many clay balls. Image Clay Sourcing Team

Figure 178e shows the textural immaturity of these sediments, which are largely reworked colluvium and fan deposits. Although well sorted (i.e. of a narrow size range) the grains exhibit high angularity and minimal sphericity, indicating a very short alluvial transport history. In 2f the compositional immaturity is also seen, with a highly mixed inclusion assemblage of dacitic and andesitic volcanics, chert and limestone in a calcareous matrix. From a provenance viewpoint, these sediments show the characteristics of the overbank silts and sandier channel facies of the Çarsamba river near to site. To date, possible raw materials for clay balls have been located in the Upper Alluvium and the Pleistocene deposits which are interbedded with the marls. Lower Alluvial sources have not been located.

Miniballs

The lower density and fine texture of miniballs (Atalay, 2003) indicates a different origin than for the silt-based clay balls. Whilst miniballs presumably have multiple origins, a quick note is made here of a possible natural source, as again this illustrates how the particular nature of the Çatalhöyük sediments may influence artefact appearance.

A comprehensive description of the May fan soils by Dreissen and de Meester in their 1969 survey of the soils of the Çumra area records that:

"In the relatively heavy-textured lower parts of the fan, clay balls up to 1cm are present, consisting of pieces of very compact soils having nearly the same grain size distribution as the matrix as apparent from table 4, but with a moderate fine to medium angular-blocky structure whereas that as that of the matrix is subangular. Presumably these clay balls have been translocated from elsewhere."(Dreissen and de Meester, 1969),

These clay balls, which in fact reach up to 5cm in diameter, are developed as a result of the swelling behaviour of the smectite-rich clay fraction of the soils. This gives rise to a prismatic structure, whose subsequent disruption produces faceted "balls" which become variably rounded by repeated wetting and drying.

The value of these soil notes are not that they suggest the actual source of the miniballs found at the site, but that they identify a mechanism by which these forms can be generated. A possibility is that some miniballs could have formed very close to the site where alternate wetting and drying of soils/sediments combined with slope movement (e.g. gullies or ditches).

Pottery

In 2006 an initial group of 22 sherds were prepared as thin sections in order to make a preliminary petrographic evaluation of Çatalhöyük pottery. The initial aims of this fabrics analysis were:

1. Description - to supplement the existing fabric classification, which was based on visual inspection alone.
2. Technology - to identify to what extent the raw materials were modified before use (e.g. by tempering) and also the forming and firing strategies.
3. Provenance - to establish where the pottery clays were sourced from both to differentiate the local and non-local manufacture and to identify changing patterns of local raw material use.

This pilot work (see 2007 Archive Report) confirmed that petrographic analysis would contribute significantly to our understanding of many aspects of Çatalhöyük pottery. Consequently, it was decided to develop an ongoing programme of pottery thin section analysis to build up a database of pottery fabrics.

Towards this, a further 42 pottery thin sections were selected in 2007. The fabric types and provenance of the combined 2006 and 2007 sections were studied by Estelle Camizuli, a geology undergraduate from the University of Nancy on gap-year training at the Oxford Research Laboratory for Archaeology. Full details of this study are given in the Appendix, which is the report submitted by Estelle on completion of her training. Presented here is a summary of the technological aspects of Çatalhöyük pottery as these are important to our understanding of the clay ball to cooking ware transition.

Technology

From form studies we already know that these are low-fired ceramics, though the firing technology does appear to improve in the Chalcolithic (Last, 2005). The Çatalhöyük pottery is routinely described as having been tempered, suggesting that it was necessary to modify the available clays before use. Whilst this is evidently the case with the early fabrics which contain large amounts of plant inclusions, it still needs to be demonstrated for the bulk of the assemblage.

Thin-section analysis of Çatalhöyük pottery confirms that the majority of fabrics were made entirely from natural sediments, without the addition of temper as previously suggested. This can be argued for by the following:

1. These raw materials are not clays which contain a few inclusions, but are clayey-silts with a very high (typically 50-60%) content of silt and fine sand.
2. It is not possible to add such high concentrations of very fine particles throughout a clay matrix, both to give a uniform distribution within a single pot or across a long-lived fabric.
3. For the finer fabrics, tempering would imply the pre-existence of two raw material types, a fine inclusion-free clay and a source of loose silt to add to this clay. These were not available in the Neolithic-Chalcolithic Çatalhöyük landscape (and are not represented today).
4. The bimodal distribution seen in some of the coarse fabrics is due to much of this sediment originating as re-worked colluvium.
5. Inclusion bimodality is also inherited from the porphyritic nature of many of the pyroclastics in the upper catchment of the May river (i.e. volcanic sediments with two different crystal sizes). Here, sediment transport by mass flow has not effectively separated the coarse and fine fractions.
6. Sediment sampling around Çatalhöyük confirms the availability (from Neolithic to present) of clayey-silts and sands with which closely match many of these pottery fabrics.
7. In the few case where the fabric have been tempered, this is usually very clear and is often highlighted by compositional anomalies which also inform on the provenance of the raw materials.

As both "mineral-tempered" clay balls and pottery are now seen to be largely non-tempered, we need to closely re-examine the relationship between the raw materials and cooking style across the clayball- cooking ware transition. From Level X11 to V11 pots are mainly organic tempered or untempered and are not used for cooking. This change in function coincides with the arrival of "mineral-tempered" fabric at level VII-VI (Last, 2005), although there are a limited number of transitional fabrics which have both organics and mineral inclusions.

If we see both the organic and mineral inclusions as temper, then this suggests the use of a fine clay to which was added first chaff and then, from Level VII, mineral sands and silts. However, if we now consider all mineral inclusions to be natural, this simply indicates a shift to siltier/sandier clay, one that does not require the addition of organic temper. Clearly these two different scenarios would have very different implications for the organisation of pottery making.

There are three possibilities for this raw material transition (now that mineral inclusions are not seen to represent temper):

1. that two types of pottery clay were available pre-Level V11 and that potters initially preferred the fine backswamp variety.
2. that only the fine backswamp clay was initially available (or accessible), but that this situation changed with Level VII.
3. that this reflects a change in the production site.

The last of these is discounted because the same fabric transition is seen in mudbricks, whose size and weight imply a local source. Also, the provenance study is showing that nearly all of the pottery was made near the mounds (see Appendix). We need now to distinguish between the first two scenarios.

While the coring program will build up a detailed picture of how the clays, plaster and soil resources changed throughout occupation, it should also be possible to see this directly in the

sequence of pottery fabrics. This year, Nurcan Yalman and her team assembled a representative sequence of East Mound pottery which was then sampled for thin sections analysis. This study will investigate how changes in form and function are related to raw material selection and manufacture.

Preliminary observations, made during sampling for thin sections, already suggest that the fabric transitions may be more complex than previously thought. For example, the Mellaart Level XII sherds in Figure 179a are made of fine "backswamp" clay but have experienced different firings. The sherd of the right had a relatively short firing which was insufficient to oxidise the surfaces. The sherd on the left has a similar fabric but has had a longer firing, allowing the development of both a thick oxidation layer and the intended red colour of the slip. Both have a black core indicating that firing transformations have only really strengthened the margins. The low strength of these fabrics would perhaps suggest that they were unsuitable for cooking, but in fact there is no reason why they could not have been used: the issue would be more of one of durability.



Figure 179: Sherds from Mellaart's Level XII. Figure Christopher Doherty

Pottery from Mellaart Level XI consists mainly of fine fabrics with organic temper, but not exclusively so. For example, the sherd in Figure 179b is made not made from backswamp clay but is a clayey silt and has no organic inclusions. This fabric is essentially the same as the silty clay balls (Figure 178a-f) and would have had the same heat transfer properties. From a technological viewpoint there does not seem to be any reason why this pot with this fabric could not have been used for cooking.

By Mellaart Level X the fabrics are still of the backswamp clay type but now have become quite variable (Figure 179c). The bottom right sherd has a large amount of chopped organic temper which is clearly visible as numerous burn-out moulds on the outer surface. The bottom left sherd also has organic temper but is very gritty. The top right sherd is very gritty and has no organic temper: this fabric would definitely have been suitable for cooking. This usage is also suggested by the sooting patterns on the bases of other Level X vessels (Figure 179d).

So how do we interpret such marked variation in organic temper and mineral inclusions? The first step is to use thin section analysis to verify whether the mineral grains are added temper or natural inclusions. But surface inspection using a binocular microscope on site suggests that they are natural inclusions, and thin section examination is not expected to revise this. So could we be seeing here evidence that the backswamp environment was receiving increasingly more sand from minor flood incursions? Fine-grained backswamp clay was still the preferred pottery material and continued to be tempered with organic matter. But maybe the occasional use of these new gritty clays lead to the understanding that they needed less organic temper and eventually that the grittiest clays needed no temper at all. Perhaps the

advantages of using gritty clays (i.e. no need to add temper, and better to cook with) might have been recognised before the fabric transition recorded at Level VII (Last, 2005).

These ideas now need to be tested out fully by integrating both thin section analysis and information from the coring program. The next step is to combine the thin sections data from this year with existing data, and present this as an on-line database. Using this format, we can query how changes in pottery fabrics reflect the accessibility of the raw clays as indicated by coring, and what similarities or differences exist with contemporary clay ball and mudbrick fabrics. For, 2009 we also hope to have a polarising microscope on site, to better integrate fabric and form studies.

Mudbricks

In 2008 work continued on the interpretation of mudbrick fabrics in order to understand: 1) what raw materials were used, 2) how these were modified and 3) how the bricks were made. To date, there have been several models of mudbricks manufacture at Çatalhöyük, and the debate still continues. This current study relies on comparing mudbrick fabrics with sediments recorded in the field as sections and cores. Laboratory analysis has yet to be completed on this reference material, and so it is perhaps wiser not to advance a new model at this stage.

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Landscape Coring - Chris Doherty (1). Mike Charles (2) and Amy Bogaard (3)

1. Oxford Research Laboratory for Archaeology, 2. Sheffield University, 3. Oxford University

The coring programme initiated in 2007 was continued this year, with the aim of increasing our understanding of the immediate physical landscape of the site. This research examines both the resources available for clay-based materials (mudbrick, pottery etc.) and the way in which the Çatalhöyük environment would have permitted or restricted various land uses.

A total of 11 cores of 3-5m depth were taken within a kilometre of the site, with an emphasis this year on the area between the mounds (Figure 180). The coring system used was the same as for 2007 (see the 2007 Archive Report), which, although only returning discontinuous core, has the advantage of being rapid and flexible (with offset coring available to sample the intervals when necessary).

In addition to coring, sections of existing drainage/irrigation ditches were cleaned up and their continuous profiles recorded. Field-walking around the site was also undertaken to map the surface distribution of coarse sand and gravel, providing a rapid method of fixing recent channel boundaries. Observations made in the West Mound deep sounding (trench 7) were also integrated into this study as this intersected the top of the marl. The laboratory analysis of the cores is still to be completed, so this report is based solely on the observations and core/section descriptions made in the field.

The transect of relatively deep cores (8m) taken in 2007 were successful in showing the relationship between the Holocene and Pleistocene sediments. Although going considerably deeper than the archaeology, this approach was necessary as it had been recognised that the pattern of Holocene sedimentation around the site was largely controlled by variations in the Pleistocene landscape.

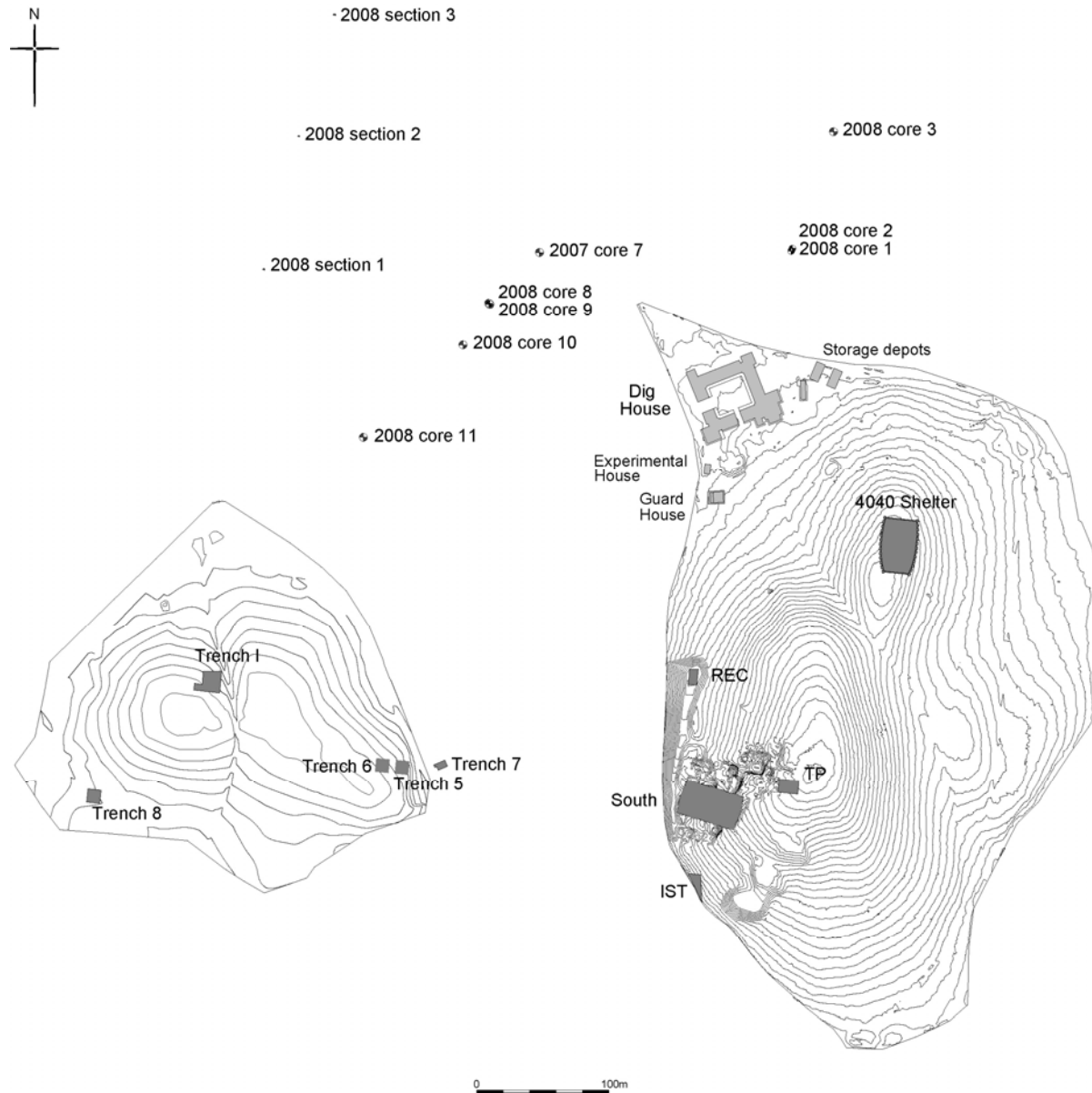


Figure 180: Location of cores 2008 to north of Çatalhöyük East and West. Plan David Mackie

This year the focus returned to the Holocene sediments; their characteristics, pattern of development, and the environment of their formation. In addition to the routine examination of cores and sections, observations were made to address a series of ongoing questions, these being:

- 1) What controls the distribution of the black "organic clay" which is sometimes recorded directly above the marl (Boyer et al, 2006)?
- 2) What is the basis for the colour difference between the Lower and Upper Alluvium?
- 3) Since Upper Alluvium-style materials are being used for mudbricks and pottery after Level VII, what are the possibilities that the deposition of Lower and Upper Alluvium overlapped?
- 4) What does the transition of dark grey Lower Alluvium to reddish Upper Alluvium tell us about the changes in the depositional environment?
- 5) What was the relationship between the Çarsamba and the mounds throughout occupation?
- 6) How did the dynamic relationship between the mounds and the Çarsamba influence the use of the sediments for mudbricks, plaster, clay balls, pottery and figurines?
- 7) Exactly how wet was this environment?
- 8) What would the soils conditions have been?
- 9) How did this evolving landscape influence land use, particularly the opportunities for agriculture?

Coring and sectioning took place in four areas (Figure 180), these being: 1) just north of the East mound, 2) between the northern ends of the two mounds, 3) the canalised Çarsamba immediately north of the mounds, 4) the Çarsamba south the mounds (not shown). These cores have yet to be screened for fine cultural inclusions and so any statements made on the latter should not be considered definitive at this stage.

1) Immediately north of the East mound.

Two locations were cored, with a second offset core taken at the location nearest to the mound. In this case (cores 1+2), the sequence was that of the generalised type for Çatalhöyük reported by Boyer et al, (2006), that is: marl ---> black organic clay ---> dark grey Lower Alluvium ---> reddish brown Upper Alluvium. However, at core 3, 100m further north, the black organic clay was entirely absent.

The depth to marl was at about 3m at both locations, with the greatest difference (15-20cm) being between the two offset cores which were only 4m apart. Here, the topographic difference is probably due to the variable presence of sandy-marl layers near the marl surface, which would have been more resistant to wind ablation.

Figure 181a (top of core on the right) shows that the black "organic" clay of core 2 has a sharp boundary against the marl but the transition into the Lower Alluvium is very diffuse (the core margins tend to be slightly smeared but the style of this transition was verified on a clean scrape). This observation (and those at other locations) raises the question of whether the black layer is of primary sedimentary origin, or whether this is partly related to soil-forming processes. Interestingly, although referred to as an organic clay, the measured organic content in many cases is not higher than the overlying alluvium (e.g. see Boyer (1999), data for 95PC1).

If the organic content is not elevated (in all cases), then the black colour is more likely to be related to the reduction of iron oxides (or the formation of iron-clay complexes). Evidence for the possible modification of sediment colour by oxidation-reduction is also seen in this core, a few centimetres above the top of black clay layer (directly beneath the label in the figure).

Here the change in colour of the Lower Alluvium from grey to brownish-grey coincides with a thin zone of orange iron mottles (formed by fluctuations of the water table).

The transition from Lower Alluvium to Upper Alluvium was not intersected in any of these three cores (as it lies in the un-sampled interval).

2) Between the northern ends of the two mounds

Five cores (cores 7-11) were taken along a 200m NE-SW transect at the northern extremities of the mounds, to cross-section the Çarsamba channel (Figure 180).

Core 7 represent the East Mound side of the channel, and here Upper Alluvium (brownish clay-silts and gravels) sit directly the marl, again at just below the three metre mark. There are no Lower Alluvium or black organic layers, and the marl surface is tilted and irregular. This probably suggests that the Upper Alluvium has cut down to the marl, but it is interesting that the lowest Upper Alluvium layer here is a fine clay which appears to infill the irregularities in the marl surface (and is clearly not erosive).

Offset cores 8 and 9 were located 50m further towards the presumed location of the channel axis (which turned out to be the case). The marl surface was not reached at the base of these cores (i.e. at 5.0m), but the high concentrations of marl inclusions and slight black mottle in the Lower Alluvium indicated that the marl surface was very close. Above this maximum depth was 93cm of light grey Lower Alluvium showing a very sharp non-erosive contact with the overlying reddish-brown Upper Alluvium (silty-clay) at 4.07m depth (Figure 181b, top of core to left). The Upper Alluvium sequence appears continuous to the modern surface, as there are no major erosive contacts. This is a series of reddish-brown silts and silty clays with thin tabular beds of sand and occasional gravel, indicating a meandering channel. Although not yet screened for cultural inclusions, there are already some interesting points emerging from the cores at this location:

(a) The position of the marl-Lower Alluvium boundary at a depth of just below 5m is direct evidence that a channel or depression was in existence here before the onset of Holocene sedimentation. We can be certain that this was the true level of the marl surface because the Lower Alluvium is not an erosive unit.

(b) This feature must have been 2m or more deep as, the top of the marl is at typically at 3m (e.g. the 2008 cores 1,2, and 3)

(c) At this point there is only 93cm of Lower Alluvium and the non-erosive transition into the Upper Alluvium does not indicate that there has been any removal of the Lower Alluvium by channelling. This implies that throughout all of the period represented by Lower Alluvium deposition, this feature was never completely filled but would have remained as a depression/channel.

(d) Even if some Lower Alluvium had been removed for mudbricks, this would still have left a depression prior to the deposition of Upper Alluvium.

(e) If this feature was not infilled by Lower Alluvium, how can the latter also be forming at higher elevations such as at cores 1, 2 and 3? This would imply the same sedimentation event at different elevations at the same time. It follows that the Lower Alluvium must be time-transgressive over relatively short distances (i.e. within 500m).

(f) The Lower Alluvium-Upper Alluvium boundary is just above 4m depth at this point whereas it is between 2 and 2.5m in cores 1+2 (and 1.5m in core 94B, the nearest taken by earlier studies (Boyer, 1999). This boundary is therefore also demonstrated to be time-transgressive

(g) The Lower and Upper Alluvium do not represent a sequence fixed in time, but are sedimentary facies whose formation is related to the depositional environment. At certain periods, Upper Alluvium would have been forming in the channel areas (e.g. cores 8 and 9) at the same time as Lower Alluvium was forming beyond the channel margins (e.g. cores 1-3).



(a)



(b)



(c)

This lateral facies variation is not visible at any one location as only the stratigraphic sequence is evident.

(h) The existence of these contemporary facies is required to explain the widespread use of brownish clay-rich silts and sands for post-Level V11 mudbricks and pottery, i.e. during the period of widespread Lower Alluvium deposition.

(i) No sedimentary hiatus is seen at the Lower Alluvium-Upper Alluvium boundary at core 8/9, this boundary being concordant and non-erosive (figure 2b). Deposition appears to pass without interruption from grey clay to brown-red clay, and the sharp boundary which has not been disturbed by bioturbation or pedoturbation.

(j) The marked colour difference between these two alluvial units need not imply progressive changes to in the river's catchment or changes in climate, and neither of these would account for the diachronous yet sharply defined boundary. Instead, this sequence can be explained by the natural evolution of the Çarsamba system combined with pedogenesis.

(k) The observations at core 8/9 are very similar to those of the shallow depression 95PC2 mapped by Peter Boyer, some 500m south-west of the mounds (Boyer, 1999). This feature also shows the Lower Alluvium transgressive over 2 meters of slope in the marl surface although here, the Lower Alluvium-Upper Alluvium boundary of the centre of the depression does not lie below that of the margins (as it does between cores 8/9 and core 94B).

Future coring is planned to determine what size of depression or palaeochannel is represented at cores 8/9, as potentially this was a major landscape feature and may have been influential in the development of the site.

Core 10 is 50m further south-west and is entirely of Upper Alluvium to a depth of 3.5m. Overall, the sediments here have more silt and fine sand and less coarse sand and gravel than cores 8+9, suggesting a relatively fixed position slightly west of the deepest/fastest part of the channel. As this sequence was not suggested on east side, it may be that the Çarsamba channel profile was asymmetric (to be tested in 2009 with further coring).

Core 11 was the final one of this sequence as the stand of popular trees immediately to the west prevented access of the truck-mounted percussion corer. As predicted, this proved to an area of much quieter sedimentation and represented a channel margin/overbank environment. Brownish Upper Alluvium clays and silts appear to pass into grey Lower Alluvium at a depth of about 1.7m, with the top of the marl coming in a just over 2.0m. The marl is therefore significantly shallower than on the east side (at 3m), which would be consistent with the suggested asymmetric profile of the channel.

Field-walking and ditch inspection also suggests the presence of another channel running from a point 100m west of core 11 along the eastern boundary of the West Mound. This is further supported by the observation of fine channel silts developed directly above Lower Alluvium at the base of trench 7 (see the West Mound section of this report for a description of the natural sediments in trench 7).

3) The canalised Çarsamba immediately north of the mound.

The Çarsamba is now canalised a few kilometres south of the site, and one channel runs along the west side of the West mound towards Küçükköy. This now dry canal provided a good opportunity to access the former site of the Çarsamba where it emerges on the north side of the mounds. Figure 180 shows the location of two vertical sections made in the east side of the canal (section 1 and 3). Section 2 was a shallow scrape and is not described here.

Figure 182a shows the sequence at the base of section 2. This has a 15-18cm black clay basal layer directly above the marl which correlates to the black "organic" layer of Boyer et al (2006), but again this boundary is very diffuse. In fact it shows strong similarities with the dark soil horizons which often form at the base of waterlogged soils due to iron reduction and downward movement of clays. For comparison, Figure 182c shows a similar waterlogged soil

(not from Çatalhöyük) which has developed such a diffuse black horizon at the base of the profile. This example also illustrates how waterlogged soils can develop horizons of markedly different and sharply defined colours within a homogeneous parent material.

Above the basal black layer is 25cm of Lower Alluvium, which is perhaps surprisingly thin unless there had been significant erosion (or removal). The characteristic pattern of prismatic shrinkage cracks shows this unit to be composed of smectitic swelling clay formed from a combination of alluvial deposition and direct weathering from the underling marl (as indicated by an increase in marl fragments towards the contact). This silty clay also has occasional coarser sand grains (observed up to 2mm in diameter), but their presence must be interpreted with caution as we observed the movement of such coarser grains downwards along shrinkage crack and root channels, being inherited from the overlying Upper Alluvium.

The Lower Alluvium shows no obvious differentiation or evidence of developing soil horizons. However, this is slightly misleading because the repeated swelling and shrinkage of these smectite-rich sediments results in complete mixing (pedoturbation) of the profile. Soils developed in swelling clays such as the Lower Alluvium are known as Vertisols. These form over relatively short periods of time and characteristically have a dark grey colour without internal differentiation. Figure 182d (not from Çatalhöyük) shows a typical vertisol with a prismatic fabric and slighter darker base. Like many vertisols, this example is under grassland and is the type of soil which would have been forming from the Lower Alluvium during the Neolithic. At Çatalhöyük, most of the pre-level V11 mudricks and pottery fabrics would have been made directly from such immature soils. Observations made this year on some organic-tempered pottery (sherds and thin sections) showed that, in some cases, some of the organic material was not added temper but the roots of plants which were growing on the Lower Alluvium when it was dug out.

The base of the Upper Alluvium is not straightforward in this section. Initially the contact was recorded as the base of the reddish clay-rich band which occurs directly above the grey Lower Alluvium (figure 182a). But whereas the upper contact of this reddish layer with the sandy unit above is well defined, the boundary with the Lower Alluvium is not. Despite being wavy, this boundary is not-erosive, with red clay sitting directly on grey. Further, the distribution of the red clay is patchy and is often seen as large mottles some of which are enclosed in a grey

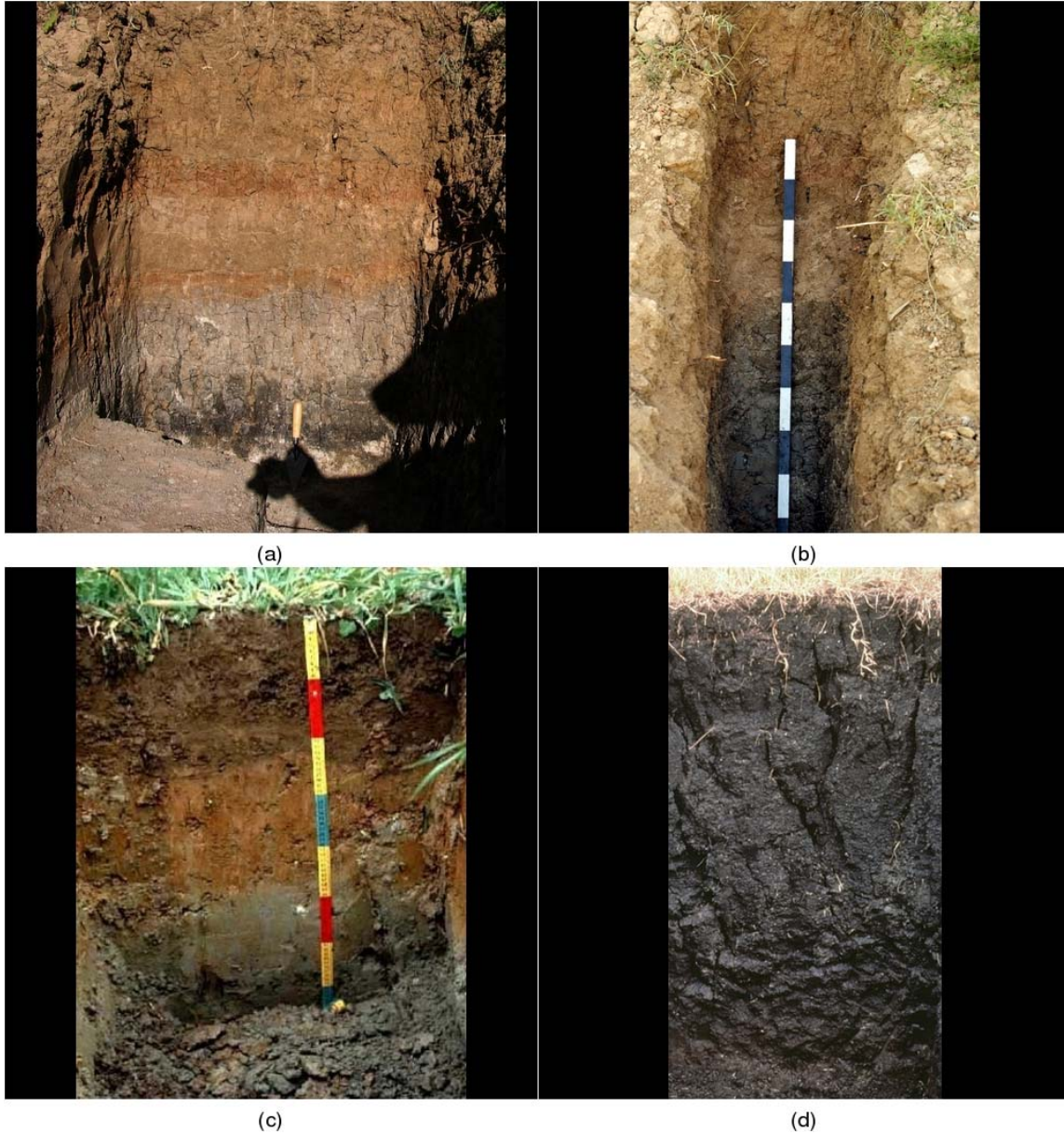


Figure 182: Sections on the east side of a dried up canal within the ancient Çarsamba River course. Photo Core Team

clay matrix. There are two possible interpretations here. First, that the lowest Upper Alluvial unit is the red clay and that this in-filled the surface of the Lower Alluvium (which had become cracked and hummocky due to drying out). Second, that this red clay layer is part of the original Lower Alluvium, which has been reddened by contact with the Upper Alluvium and/or as a result of over-oxidation by groundwater.

The next unit of the Upper Alluvium in section 1 marks the first true change in sediment type. This is a layer of sand and gravel which does have a slightly erosive base and marks the arrival of a small alluvial channel. From this point to the modern surface there is a cyclic series of red sands, silts and clay which record the persistence of a meandering river. Gravel and coarse sandy facies are relatively rare, with the sequence being dominated instead by fine silts (now silty loams). These Upper Alluvial sediments are very similar to those of the post-Level V1 mudbricks and mineral-tempered pottery, which must have been made from similar raw materials.

Section 3 is approximately 200m north-north east of section 1 and shows a slightly different profile (Figure 182b). There is no clear separation between the Lower Alluvium and basal black organic layer, but instead the profile simply becomes progressively darker with depth. Taken as one layer, the Lower Alluvium/black clay in this section is 50cm thick. This is greater than the 25 cm of Lower Alluvium at section 1 but roughly equivalent to the 43cm of combined black layer and Lower Alluvium of the latter. And if we include the lowest red clay layer of section 1 into its Lower Alluvium total (second interpretation) then both sections show exactly the same thickness of Lower Alluvium.

Unlike section 1, section 3 does not have a red clay layer between the Lower and Upper Alluvium, but the latter does begin with the same sand and gravel channel deposit and shows essentially the same uninterrupted sequence to the modern surface. These two sections together identify a large area of mainly silt deposition. The suggestion here is that the Çarsamba was constrained within a series of small channels as it passed between the mounds (where it formed gravel lag deposits). On emerging it then spread out and shallowed, depositing silts from the slower-moving waters. These silts have given rise to a belt of better-drained loamy soils which run northwards to Küçükköy.

4) The Çarsamba south of the mounds.

Cores were taken at two further locations 750m south of the West mound (south of the area covered in Figure 180). The aim was to observe the sequence where the Çarsamba is thought to pass over a small marl ridge. Cores were taken in the fields either side of the road south from Çatalhöyük just before the junction with the turning for Alemdar.

A pair of offset cores (4 and 5) were taken immediately east of the canal by Alemdar bridge. The Lower Alluvium-Upper Alluvium contact was not intersected but the clays appeared to change colour gradually from reddish brown to grey brown before coming down onto the marl surface at a depth of 2.6m. There was a total absence of black (organic) clay between the (presumed) Lower Alluvium and the marl, and this contact was marked by oxidation of the alluvium from grey to reddish brown (figure 2c, top of core on right). The marl here was also relatively thin (25cm) and passed down into a dark brown-grey Pleistocene clay unit. As this appeared almost identical to the "Lower Alluvium" above the marl we need laboratory analysis to determine whether in fact there may be a Pleistocene clay bed above the marl at this point.

Core 6 was taken 300m east of cores 5/6 in an area identified from field walking as having recent channel sands and gravels near the surface. Red-brown clayey silt and sands came down on dark grey clay at a depth of 1.65m. This is presumed to be Lower Alluvium although, unusually, it had thin silt and fine-sand laminae. The contact with the marl was not intersected but from the rapid increase in fine marl inclusions at towards the base of the "Lower Alluvium", the depth to marl is estimated at between 2.2-2.5m. Where the marl is sampled in the next interval (3.0 to 3.5m) it is seen to be of very high quality (high whiteness) and sits above a coarse sand and gravel base.

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Speleothem Project 2008 - Gülgün Gürcan

Team: Gülgün Gürcan (1) Yaman Özakin (2) Kayhan Ata (2)

(1) Trakya University (2) Boshourus University

A project initiated by Doç. Dr. Burçin Erdoğan and Gülgün Gürcan - Trakya Üniversitesi Arkeoloji Bölümü to identify the location of cave sources of Çatalhöyük's speleotherms was conducted in 2008.

To date the speleotherms (a speleothem is a secondary mineral deposit formed in caves) from the Çatalhöyük have remained unstudied. During the 2008 season an inventory was made of the identified speleotherms from the project database as well as with personal communications in the field. Later, a survey around Konya plain, in the region of Karaman, Beyşehir, Seydişehir was conducted with the aim of the identifying cave sites with speleotherms.

Methodology of this project as follows;

1. Creating an inventory of the Çatalhöyük speleothem artefacts.
2. Recording and sampling caves for speleotherms.
3. To source Çatalhöyük speleotherms through trace element analysis.

Çatalhöyük speleotherms can be analysed by ICP-MS "Inductively coupled plasma mass spectrometry" to explicitly identify the location of the caves. Trace elements from Çatalhöyük's speleotherms can be recognized. These elements are unique to sample and can therefore be treated as a 'fingerprint'. Later speleothem samples from cave context should be analysed for identifying the extent and range of potential discrimination between them which will serve to identify the caves from where the speleotherms were brought to Çatalhöyük.

Preliminary work for 2008:

The number of samples studied;

1. A large block of stalactite: Unit (11904), Building 52, 4040 Area
2. A small 2 cm long piece of banded dog -tooth calcite spar speleothem: Unit (14019), South Area
3. A colourless band from a dog-tooth calcite spar: Unit (12438), IST Area
4. Small pieces of colourless calcite crystal : Unit (17017), South Area
5. A small 5 cm speleothem piece: Unit (13952), IST Area

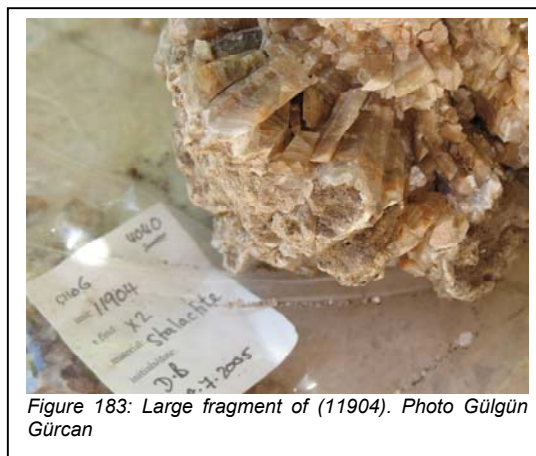


Figure 183: Large fragment of (11904). Photo Gülgün Gürcan

Mellaart (1967) pointed out that broken stalactites were deposited in special buildings.

Future aims of the project include visiting Museum's stores to find speleothem samples of the 1960's excavations.

In 2008 our cave survey lasted for a week in August. Yaman Özakin and Kayhan Ata from the Boshourus University Caving Club joined the survey. Four caves namely Eşekini, Direkli İn, Kapalı İn and Hatçenin İni were investigated in the area around the Beyşehir Lake, skirts of Mount Gürdağ and Yeşildağ. An important cave of Ferzene (364 m length, -5m depth) in Seydişehir was also investigated. This cave was a secret cave during the Roman period.

Four caves namely Arapyurdu I, Asarini, İncesu and Asarini-Taşkale were also investigated in the Karaman region. Speleothem samples were taken from all these caves.

Preliminary results of the cave survey suggest that the Ferzene and İncesu caves are originally hydrothermal caves which produces dog-tooth spar speleothems similar to most of the Çatalhöyük assemblage. Samples taken from these caves are promising matches with the Çatalhöyük speleothems. Future aims of the project include analysing speleothem samples both from Çatalhöyük and the caves of Ferzene and İncesu using ICP-MS.

The Çatalhöyük speleotherms (stalactite and stalagmite) are found in a variety of contexts and some are fashioned into figurines and ornaments. It is generally accepted that the speleotherms of Çatalhöyük were collected from limestone caves located in the Taurus Mountain, south, south-west of Çatalhöyük but this premise has never been tested. This survey therefore, is concentrating in this region for verification. A further aspect of the research is for isotopic analysis, which will give us information on the past climate of the region.

In many cultures caves are sacred places where one can pass to the spiritual world, plus speleotherms are often associated with fertility and healing power. In his paper Lewis-Williams (2004) proposed that speleothems serve as means for the spiritual world. The survey to locate the hypothetical "sacred caves" for the people of Çatalhöyük may give us an insight into another aspect of the Neolithic psyche.

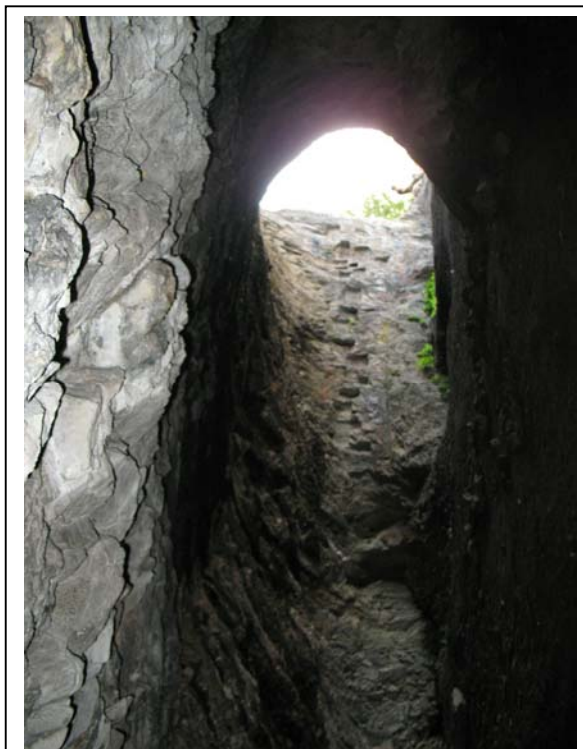


Figure 184: Ferzene cave entrance in Seydişehir at the skirt of Taurus Mountain. Photo Gülgün Gürcan

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Fire and burning at Çatalhöyük, 2008 – Karl Harrison

LGC Forensics & Cranfield University

Introduction

The 2008 season afforded the opportunity to examine two buildings subject to distinct burning episodes, in addition to a return to Building 80 to consider analytical approaches prior to further excavation. The evidence presented by the two new structures prompted consideration of differences in fire dynamics between them; potential variation in fuel load, and the analytical potential offered by magnetic susceptibility survey. This work revisits some early observations made with regard to burning at Çatalhöyük in the 2004 season (Harrison, 2004).

Building 77

Building 77 offers a dramatic example of apparently extensive thermal alteration. The main occupation area is significantly rubified, presumably through the process of firing structural

elements of the building (see Figure 185). This discolouration was particularly apparent on the south wall to the west of the ladder scar, and along the west wall dividing the storage area from the main occupation area. Although reddening was also observed on the northern and eastern walls, it appeared lesser in intensity, other than where apparent structural features exacerbated the destruction (such as the opening in the north wall, or the upright timber in the east wall, both discussed below).



Figure 185: Building 77 looking west

More protected areas within Building 77 appear to have remained cool enough to facilitate the settlement of carbon products from the smoke of the fire. By applying the principle of heat shadowing (DeHaan, 1997), these features can be useful in establishing the main focus of burning. The southeast corner of the main room preserved significant quantities of smoke staining, despite being in close proximity to the timber upright that appears to have been a secondary seat of burning (see Figure 186). This



Figure 186: Protected area to east of ladder scar (right) on south wall, Building 77

suggests that the plaster moulding associated with the ladder interfered with the direct transmission of heat by radiation, placing the focus of the fire to the west of the ladder and closer to the centre of the room. Such an observation may seem facile when discussing the

southeast corner of a fire compartment, but it served as an indicator to rule out the nearby timber upright as a potential initial seat of fire.

Similar settlement of carbon-rich smoke products are evident along the north wall, both in small quantities at low heights along the plastered north wall. Again, whilst there is less obvious indication of directional heat shadowing, the blackening suggests a general low-temperature area located some distance from the centre of burning.

In contrast with the extensive discolouration of the main room, the storage area to the west of the main room revealed relatively limited evidence of thermal alteration. The walls, particularly the exterior western wall exhibited more uniform charring, suggesting a generally low temperature or more limited exposure to direct flame impingement. Some reddening was visible on the exterior western wall directly opposite the opening through to the main room, but this may be explained via radiative heat transmission through the doorway from the main focus of the fire.



Figure 187: Storage bins to the north of the western room, Building 77

Further reddening was evident on and around the clay bins to the northern end of the storage room (see Figure 187). This pattern is harder to relate to a fire occurring in the main occupation area of the building, but should a flameover fire have developed for any length of time, the nature of the fronts of the storage bins would have been especially vulnerable to the effects of heating, due to their high surface area to mass ratio.

The extensive structural damage and discolouration in Building 77 is most easily explained through the mechanism of flameover within a secure compartment (Hinckley & Williams, 1986, 1). Unlike open combustion, where partially burned pyrolysis products such as carbon-rich smoke are carried away along with the majority of the resulting thermal energy via the process of convection, which forms a hot layer of hot fuel-rich smoke in the upper part of the room. Figure 4, below, details a potential model of flameover fire development within Building 77.

As the fuel layer continued to develop, the temperature inside the compartment continues to rise and oxygen levels drop. At a critical point, the smoky fuel ignites spontaneously and transmits large amounts of energy downwards and sideways, through the action of radiative emission.

This model of flameover development, initiated somewhere on the floor near to the middle of the southern wall would most easily account for the widespread intense discolouration, the fire indicators continuing into the storeroom, and the scant numbers of protected areas apparently exposed to lower temperature around the eastern edge of the compound. For this model of flameover fire to reach its peak, it requires a high degree of structural integrity and a significant quantity of fuel, beyond that present in the model of reconstruction suggested by the experimental house.

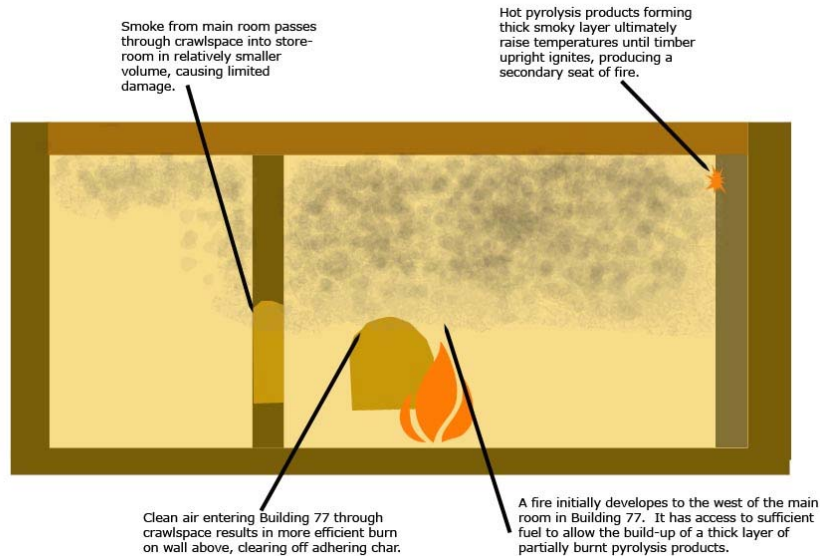


Figure 188: Section through Building 77, detailing potential model of fire development (not to scale) Image Karl Harrison.

Evidence of low-level ventilation of the fire in Building 77 is demonstrated in patterns of carbonisation around the opening in the north wall (see Figure 189). At the time of visiting the site, the back of this feature, to the north of building 77, had not been reached, and it is unclear whether it may simply be a niche, or a deeper crawlspace. The relatively clean plaster area above the opening suggests the latter, as ventilation into the room would result in a locally improved efficiency of burn that would increase temperature and facilitate the secondary burning of settled carbon from earlier smoky combustion.

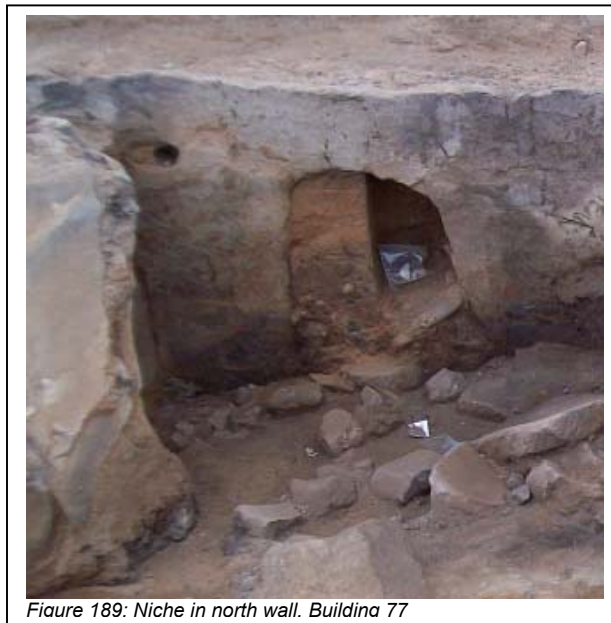


Figure 189: Niche in north wall. Building 77

One of the most dramatic fire indicators preserved within Building 77 was the base of the timber upright against the east wall. This appeared to be completely carbonised, still standing to a height of c. 20cm, and its line up the east wall of the building is preserved by the scar running through the wall plaster. The extent of fire damage is also indicated by the striking 'v' pattern preserved against the adjacent wall and floor, where settled carbon smoke products had again been cleaned through secondary combustion via locally elevated temperatures (see Figure 190).

'V' pattern analysis has been noted by fire investigators as being a potential indicator of seats of fire origin (Redsicker & O'Connor, 1997; DeHaan, 1997, 147). In this instance, however, there is no further evidence of other fuel sources close to the upright to facilitate fire spread, and the southeast corner otherwise appears to be a relatively cool area during the fire, indicated by the surviving char on the walls. Furthermore, the massive timber upright would require a significant input of energy to initiate flaming combustion.

Rather than representing an initial point of origin, it would more reasonably represent a secondary seat of burning, ignited following the peak of development of a fire originating to the west. The degree of thermal alteration apparent, and the maintenance of the compartment integrity suggest both a massive fuel load and a very secure design of roof. Similar levels of destruction were seen following the burning of a cellared timber building at West Stow, Suffolk in



Figure 190: 'v' pattern burning centred on timber upright. Building 77.

2005 (Harrison, 2007, 2; also see Figure 191). In a similar fashion, the height of the standing walls of Building 77 and intensity of destruction may suggest a similar arrangement, with some form of second storey constructed with the use of combustible products forming a secure roof on the surviving plastered walls.



Figure 191: (left) Farmer's House, West Stow, prior to the 2005 fire (right) The cellar area beneath the the day following the fire (Photo: Alan Baxter)

Building 52

In contrast with Building 77, Building 52 located directly to the south within the 4040 Area exhibits heat-related discolouration restricted almost entirely to the middle of its central floor platform, and the raised platform directly to the north (see Figure 192).

In addition to the outline of burning on the house floor, some raised elements of wall structure also appear to have been damaged by fire, most notably a wall end to the south of the main room (see Figure 193). Although somewhat removed from the burning on the floor, a charred timber upright in direct contact with the wall suggests that this point may have formed a localised centre of burning.



Figure 192: Fire-related discolouration to main floor platform, Building 52



Figure 193: Promontory to the south of main burning to floor, Building 52.

Surrounding the discolouration on the floor of Building 52, a wide halo of blackened char suggests a rapid lateral depreciation of temperature away from the centre of the burning. In places, this halo of char appears to preserve angular relationships that suggest either an outline of smouldering timbers, or protection by overlying material, or else smoke spread that has not been overly affected by the geometry of the building (see Figure 194).

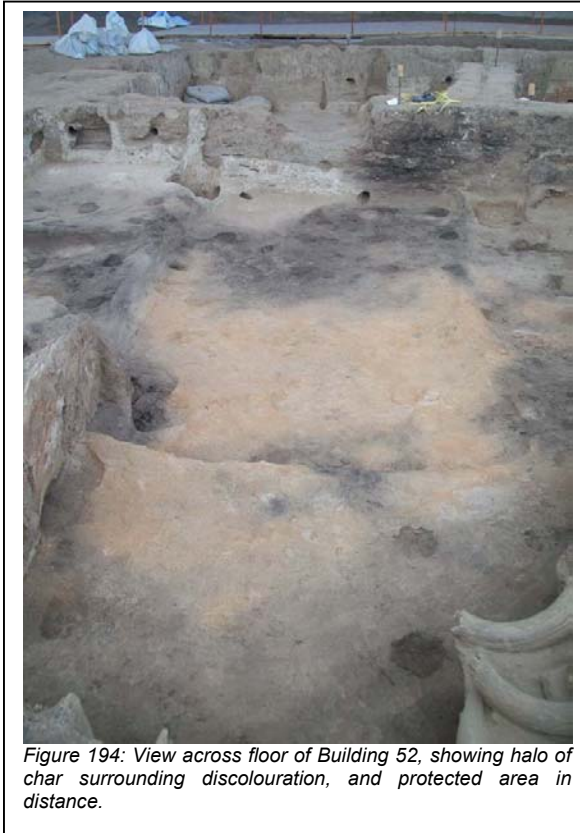


Figure 194: View across floor of Building 52, showing halo of char surrounding discolouration, and protected area in distance.

The pattern of burning in Building 52 suggests an open combustion that has not been exacerbated by the presence of a roof over the compartment throughout the development phase of the fire. Because of this, convection currents that have been shown to be such an important mode of heat transmission in modern fires would have been allowed to vent to the open air, rather than being retained to further increase heat within the compartment, as appears to have occurred in Building 77.

Conclusion

Together, Buildings 77 and 52 offer an exceptionally valuable insight into the range of patterns apparent in the evidence of structural burning preserved at Çatalhöyük. The widespread dramatic elevation in temperature apparent in the marked discolouration of mud brick and plaster in Building 77 are indicative of a ventilation-controlled flameover fire similar in character to modern compartment blazes, and requiring sufficient levels of fuel and structural integrity to maintain peak burning long enough to promote thermal alteration across the main room of the building. By contrast, the fire characteristics of Building 52 are indicative of a fuel-controlled open combustion incapable of further lateral spread due to preferential heat loss upwards.

Further work

Improved quantitative understanding of structural fire at Çatalhöyük must be developed in order to facilitate a more mature understanding of the complex and dynamic processes of combustion observed in the material record. To that end, a range of mud brick control samples have been taken from Building 79 in the South Area. The building itself has not been subjected to significant heat alteration, but examination of the response of its building materials will hopefully provide information on the firing of its close neighbour, Building 80. It is hoped that sequential kiln firing experiments over a range of temperatures will assist in establishing the thermal inertia of the mud brick. This in turn will be instrumental in calculating the actual inputs of thermal energy into the fabric of Building 80, and thus the volume of fuel required to feed the fire. It is envisaged that thermal alteration will be monitored via both discolouration and elevated magnetic susceptibility. It is hoped that the appreciation of levels of magnetic susceptibility across the site will be facilitated by the work on buildings materials conducted by Serena Love.

Furthermore, it is hoped that the standing walls of Building 77 can be subjected to a similar magnetic susceptibility survey, providing data on thermal alteration in three dimensions, in an

effort to more accurately trace the distribution of thermal energy within the main compartment of the fire.

A series of visual models and scaled experiments exploring a variety of potential fuel load arrangements within the structures is seen as being a crucial piece of work to follow better quantitative understanding of the various structural fires on the site. Such models should include consideration that much of the fuel relating to the apparent flameover fires might originate within a second storey or mezzanine constructed largely from combustible materials. It is hoped that a series of three-dimensional virtual fire constructs established on the OKAPI Second Life resource of Berkeley University by Colleen Morgan will assist in communicating some of the essential points relating to the various models of fire development discussed in this article.

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Modelling Chronology - by Alex Bayliss (1) & Shahina Farid (2)

(1) English Heritage, (2) Çatalhöyük Research Project

Work on the new dating programme has progressed steadily during 2008. Resources will be concentrated on providing a detailed chronology for the whole depth of the east mound sequence, covering the South Area, Mellaart's excavations (as far as the surviving archive allows), and the TP Area.

In the first months of the year, in London, we concentrated on identifying articulated bone samples from the excavations in the South Area. This was done using the unit and faunal databases, and the published or site-archive matrices. Articulated or articulating bone samples will be critical in the proposed dating programme as they are unlikely to be residual, and so the stratigraphic sequence between samples can be used to refine the dating provided by 'raw' calibrated radiocarbon dates.

In June and July we started to study the published stratigraphic sequence from the Mellaart buildings in detail. This will form the basis of an integrated stratigraphic sequence for the Hodder/Mellaart excavations in the South Area which is a major objective for the dating team in 2009. This will be incalculably enhanced by analysis of a series of original, unpublished plans loaned to the project by James Mellaart.

In August Alex visited site for the first time. In an intense week, she started the assessment of the TP matrix with Arek Marciniak & Marek Baranski, and



Figure 195: Arek and Alex assessing the potential of the TP Area for radiocarbon dating, using Marek's four glue-stick matrix! Photo Marek Baranski

sampled 207 articulated/articulating bone groups (thanks to Kamilla Pawlowska, Nerissa Russell, David Orton, Lisa Yeomans, & Başak Boz). From the existing stable isotope study, it is probable that around 20% of these bones will not contain sufficient collagen for radiocarbon dating. Tiny sub-samples of whole bone have been taken for %N analysis, in an attempt to identify most of these samples before costly gelatin extraction (Brock et al 2007). Jessica Pearson is kindly organising this work.

At Çatalhöyük it was very apparent that interrogating the faunal database is an inefficient way of identifying articulated bone groups. Although it is possible to find articulations from this way, on opening the actual bags a faunal specialist can identify 3 or 4 times as many suitable samples. The dating assessment in 2009 will therefore now concentrate on identifying units in the matrix where samples are needed, so that faunal assemblages (particularly from middens) can be scanned for articulating bone groups.

In December, Alex visited Poznań to continue work on the TP matrix with Arek & Marek. We succeeded in identifying high-priority units for faunal assessment in 2009 from the 2001-2007 seasons, although we will need to reconvene before the 2009 season to identify likely units from the 2008 excavations. On parting, we all have our list of homework to complete before next time...

Reference

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Re-assessment of the existing dating of the East Mound – a progress report - Alex Bayliss & Shahina Farid

As part of the new dating programme, a thorough re-assessment is being undertaken of the existing dating information from the East Mound (Cessford 2005). This includes re-interpretation of the taphonomic derivation of the dated samples within the sequence of contexts from which they were recovered, and a re-assessment of the technical procedures used to produce the measurements.

It is apparent that the existing site phasing scheme (the “Levels”) is only broadly chronological. Later “Levels” are particularly poorly dated, as acknowledge in the current analysis. In due course, these data will be integrated into a revised chronological model for the South Area.

This re-assessment, however, has revealed that that some of the results from the North Area at Çatalhöyük had been affected by a technical problem with the method of bone pre-treatment used by the Oxford Radiocarbon Accelerator Unit between 2000 and 2002 (bone and antler samples in the range OxA-9361 to -11851 and OxA-12214 to OxA-12236), which resulted in some bone samples giving ages which were about 100 – 300 radiocarbon years (BP) too old (Bronk Ramsey et al 2004).

Oxford have kindly agreed to repeat the relevant measurements at no charge to the project. So far, five results have been repeated, in each case giving slightly younger results. Further work is on-going, but preliminary re-analysis of the radiocarbon dates from the North Area (Buildings 1 and 5) suggests that these may have been constructed and occupied in the later 66th and 65th centuries cal BC. This would place Buildings 5 and 1 in Levels VII and VI in the existing site phasing scheme (Cessford 2005, fig 4.3), rather than Levels IX to VII (ibid p88).

References

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The sun clock and light and shadow inside the on-site replica Neolithic House – Eva Bosch



Figure 196: After spending two days inside the experimental house observing the light pattern created by the sun light against the Southern, Western and Eastern walls I noticed a sun-clock.

See DVD No. 4 “The Sun clock – Light and dust – Three Poems” .

It can also be seen in “You-tube”. Links as follows:

<http://www.youtube.com/watch?v=9oUQIIcuY9c>

<http://www.youtube.com/watch?v=64DIgYzQVkc>

A beam of light entered the house crossing through the wooden ladder and creating a shape on the West wall. The semicircular movement created by this image that slowly became a rectangular shape reflecting the rung of the ladder, would start from the centre of the West wall and would disappear at about 40 cms from the ceiling of the East wall.

The angle of the diagonal beam of light entering the units would vary slightly from house to house and because of the Earth’s movement the pattern would also travel from left to right giving an exact record of the time of the day as well as the Season.

Beside the functional purposes of the Sun clock I observed that at about 16.30 on July 17th (the degrees of the diagonal of the beam of light obviously change daily) the sun projected a perfect screen on the East wall that remained there long enough to perform projections; shadows could be produced either by using hands, objects or the figurines I had made. This demonstrated that our 9000 year old ancestors had the facility of projection; what could be called prehistoric cinema.

Then using old card board and the broken sacks of polyester from the bins I made cut outs of figures and animals. I assume that the sharp edge of the local obsidian stone did provide the Catal people with very efficient cutting tools. Similar cut outs could have been made using the left over of dry skin, soft wood, twigs or leaves.

A small video titled "Shadowhoyuk" was also produced in collaboration with archaeologists Ruth Tringham and Steve Mills.

A complete record of the images and shadows are recorded in the DVD titled No. 2 "Figurines – Shadows – Making the oven work" .

To speculate on what or how the Neolithic person used these images for would be foolish, but there is no doubt that the shadows were there to be seen daily. Furthermore if children or disabled people were at some point forced to remain inside the house for days, the possibility of creating moving images could very well have been a method of entertainment. Dust and smoke would also create wonderful images when travelling across the beam of light. See DVD titled No. 4 "The Sun clock – Light and dust – Three poems"

Because of my Catholic upbringing when I started to edit the footage from the house I kept on hearing in the back of my mind Maria Callas singing Bach's "Ave Maria". Of course my associations have nothing to do with the belief or response that the people of Anatolia would have had. However, what seems certain is that there was an emotional outcome generated by the beauty of the wonderful beam of light entering their lodgings. An outcome loaded from whatever belief the town people shared.

COMMUNITY COLLABORATION PROJECT REPORTS

Introduction to the Çatalhöyük Summer School – Shahina Farid

This programme's success is proved by the fact that it has taken place on site on a seasonal basis since 2002 when it was initiated as part of an EU funded programme to promote the education of archaeology in schools.

It is aimed to educate young people from the Konya region, and other areas of Turkey, about the importance of archaeology for Turkey and about Çatalhöyük. It is also an important programme for involving the local community in order to better understand our shared heritage and responsibility to it.

Each day for a month over the season about 20 children from schools, clubs and orphanages spend the day learning about the site and archaeology in general (see Figure 9). On arrival the children are given a slide show in the on site Visitor Centre with lots of pictures, interpretations and reconstructions, some in cartoon form. This is followed by a tour of the excavation areas where they can watch the archaeologists at work and ask questions.

They are then led to the 1960s spoil heap that lies along the western edge of the East mound, called the REC Area (for RECYCled), well away from the excavation areas but within the site perimeter fence. As 100% sieving was not a methodology used in the 1960s there are still small fragments of material to be found and the children delight in the discovery of these fragments of bone, clay and stone through sieving.

Included in the daylong workshop are presentations, tours and an afternoon of making things out of clay or painting. They also write stories; a set of diaries written as Neolithic children has been published by the programme sponsor and a new publication is planned.

After lunch at the site, sometimes donated by the Çumra municipality, they make things relating to what they have learnt about Çatalhöyük. They make clay models of mudbrick houses, animals and figurines. They paint the images and symbols of the site on the walls of the experimental house, or mould reliefs on tiles or print scarves with the same designs we find in clay stamps. This year the programme included a theatre workshop. They write stories, some of the ideas they are given are to write a diary as a Neolithic child or write letters to a Neolithic child or as a Neolithic child to the 21st century.

The programme develops year by year and now involves schools from all over Turkey, as far as Istanbul. This naturally feeds into the local economy through hotel bookings and tours to other attractions in the Konya region.



Figure 197: Different activities that the children take part in at the Çatalhöyük Summer School

2008 Çatalhöyük Summer School Project - Gülay Sert

Team: Gülay Sert, Nuray Kaygaz, Işıl Demirtaş, Kemal Oruç



Figure 198: Summer School Tour of the South Area

In 2008 season Çatalhöyük Summer School Project took place between 5th of July to 3rd of August and the work went on for 26 days in total.

In total, 431 students and 92 adults (including teachers, trainers, parents and imams) attended this workshop. A power point presentation was given to 262 students who came to Çatalhöyük as part of the “Embracing the Youth Project”. Activities of a theatre show, talks and making reliefs was organised for 50 children who came to site as part of the “Community Day” that was organised at Çatalhöyük for Küçükköy residents. In total 835 people took part in the Çatalhöyük Summer School Workshop.



Figure 199: Theatre workshop

The workshops took place between 10.00-to 15.00 and included:

- Introducing Çatalhöyük with a power point presentation at the visitor centre
- Studying the Experimental House
- Visiting the excavation area, discussing the finds
- Some excavation work on Mellaart’s spoil heap (REC Area).
- Figurine and model house making using clay
- Making wall paintings and wall reliefs
- Printing on textile
- Theatre workshops that was themed around life 9 thousand years ago.
- “Protectors of Cultural Heritage Certificate” was given to the attendants.

The workshop was completed successfully within the planned timetable.

Acknowledgments

I would first like to thank Çatalhöyük excavation team, but also to Shell & Turcas, Bifa Biscuit Factory, Coca-Cola, Konya Stockmarket, Güllüoğlu and Aytok Makine for their support.

Community Archaeology Research - Sonya Atalay

In the 2008 field season the Community Archaeology Research Project included myself and a team of three graduate students – Lewis Jones, a PhD student at Indiana University, Yasemin Özarıslan and Latife Sema Bađcı, both MA students at Middle Eastern Technical University. During our four weeks at atalhyk, we completed several projects aimed at engaging the local residents living in five villages near atalhyk. These projects included: 1) a community day at atalhyk; 2) interviews with community residents; 3) a science cartoon about the archaeology research at atalhyk; and 4) a community newsletter about the research at atalhyk. All of these activities were conducted with the kind help and generous support of the muhtar from each village. My sincere thanks is given to the muhtars and other city leaders for their help.



The Community Day was held on Wednesday, July 30. Residents of Kckky village were invited to attend. This season's Community Day attendance was double the attendance from 2006 -- nearly 400 people attended this year. The events included five 25-minute tours of the site, led by site director, Ian Hodder, and several archaeologists working on site. Visitors also participated in hands-on



activities to learn more about archaeology practice, such as learning about obsidian, paleoethnobotany, faunal analysis, and ceramic analysis. There were several slide shows in which the goals and questions of the research taking place at atalhyk were explained. There were also activities specifically for children conducted by Gulay Sert, who runs a daily kids camp at atalhyk. The activities were



followed by a group feast during which residents from Kücükköy and the archaeologists working on site were able to share a meal and conversation.

My team also conducted 28 interviews with families (talking to over 125 people) in five locations: Kücükköy, Abditölü, Çumra, Karkın, and Dedemöglü. These interviews were designed to increase our understanding of the ways that the research at Çatalhöyük affects people living around the site and the ways that local residents are interested in becoming more involved in archaeology. There was a focus on the importance of preservation and protection of all archaeology sites in the region and the need to stop looting in the area. The data from these interviews demonstrate that people living around Çatalhöyük are very interested in the archaeology taking place there, although they know very little about it. They want to learn more. They are also very interested in ways they can be involved in protecting the site and managing it long-term, after the archaeology project is completed.



A cartoon for children (Figure 200) and a newsletter for adults were created this season. Both were distributed widely in the five villages mentioned above. The goal of these items is to help educate local residents about the process of science and how archaeology knowledge is created. New cartoons and newsletters are planned four times each year and will be distributed by Çatalhöyük site guards to schools and public locations in the same five villages.



This was a very successful field season for the community archaeology project. Residents in the nearby villages and town were highly interested in the research taking place at Çatalhöyük and showed extreme desire to learn more. We plan for this continued work to take place in future field seasons.

Photos on Community Archaeology Day



ARKEOLOGLAR BU SORULARA NASIL CEVAP VERİRLER?

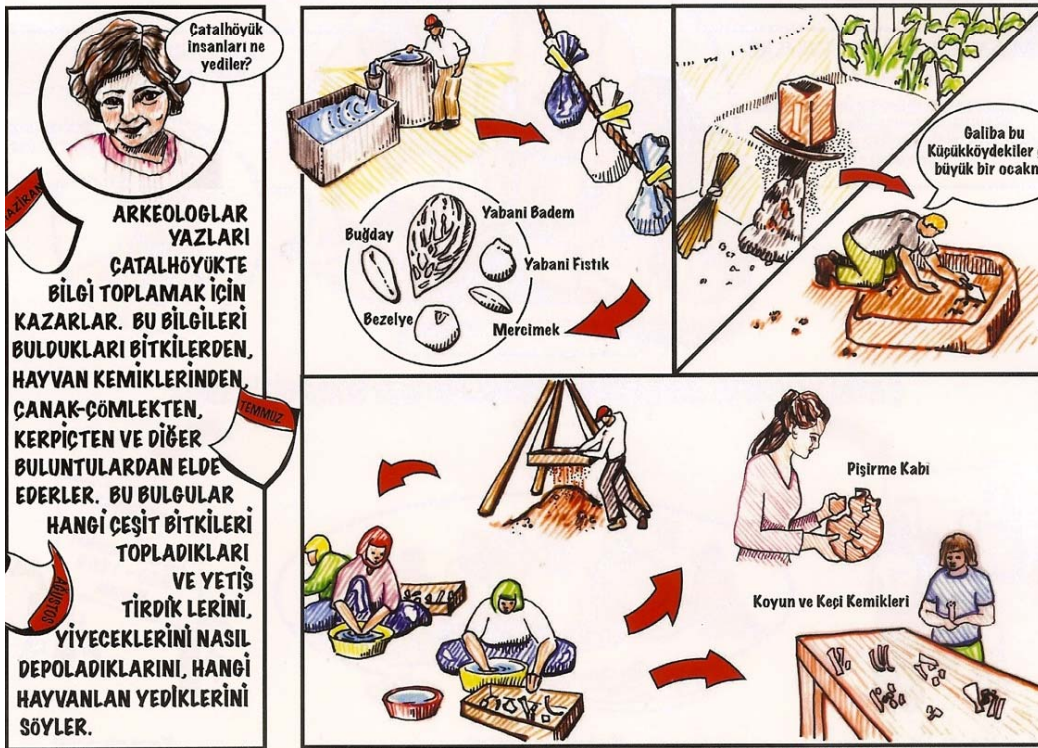


Figure 200: Çatalhöyük cartoon for children that was distributed to five surrounding villages. Illustration Katherine Killackey

Clay Provenance of Neolithic and Chalcolithic Ceramics from Çatalhöyük (Turkey)

First conclusions and Questioning...

Gap Year Report

From the 14th of April to the 3rd of August 2008
At the Research Laboratory for Archaeology and the History of Art (RLAHA)

Estelle Camizuli



Directed by:

Mr. Chris Doherty, geologist at the RLAHA, Oxford, UK

Mr. Jacques Yvon, director of the LEM, Nancy, France

Abstract

The aim of this internship was to determine the provenance of the clay used in order to make the ceramics which has been found on the archaeological site of Çatalhöyük in Turkey.

Çatalhöyük was a very large Neolithic and Chalcolithic settlement in southern Anatolia. Located at 11 kilometres North of Çumra, in the Konya Basin (former Upper Pleistocene lake), it was occupied between 7400 and 6000 BC.

The word « Çatalhöyük » comes from Turkish « Çatal » - fork- and « Höyük » - mound. The site is actually formed by two mounds between which the Çarşamba river runs.

The site geology is quite complicated, indeed an other river has an influence. The May river runs in volcanic areas before joining the Çarşamba at the border of the Konya Basin.

The project would like to prove the benefit of understanding ceramics thanks to the geological knowledges. It is split into three main points:

- A short description of the archaeological and geological context of the site nowadays.
 - A presentation of the samples which has been studied and of the methods used in order to characterise the clays.
 - And finally, the first conclusions based on the petrographical observations and the geological knowledges of the area around the site. This observations have concluded to ten groups of ceramics and four main probable provenances, which are:
 - the Upper May River (inclusions mainly volcanic);
 - the Upper Çarşamba River (inclusions mainly limestones and chert);
 - the Konya Basin (the Çarşamba -May Fan and the marl lake);
 - Non local/ "exotic" (metamorphic, tempered...).
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Résumé en français

L'objectif de ce stage a été de déterminer la provenance des argiles utilisées pour la fabrication des céramiques retrouvées sur le site archéologique de Çatalhöyük en Turquie.

Ce site est l'un des plus grand site Néolithique-Chalcolithique du Proche-Orient (Sud de l'Anatolie). Situé à 11 kilomètres au Nord de Çumra, dans le bassin de Konya (ancien lac du Pléistocène supérieur), il a été occupé entre -7400 et -6000 avant J-C.

Le mot « Çatalhöyük » vient du turc « Çatal » - fourche- et « Höyük » - mont. Le site est en fait constitué de deux monts entre lesquels circulent les bras de la rivière Çarsamba.

La géologie du site est complexe puisqu'un autre système fluvial entre en jeu. La rivière May traverse des terrains volcaniques avant de rejoindre la Çarsamba au niveau de la bordure du Bassin de Konya.

Le projet vise à démontrer l'intérêt de la compréhension des céramiques grâce aux connaissances géologiques. Il s'articule en trois phases majeures :

- Une présentation du contexte archéologique et géologique du site à l'heure actuelle.
- Une description des échantillons retenus pour l'étude et des méthodes utilisées pour caractériser les argiles.
- Et enfin, les premières conclusions basées sur les observations pétrographiques et les connaissances géologiques du terrain autour du site.

Ces observations ont permis de déterminer dix groupes de céramiques et quatre origines probables, à savoir :

- En amont de la rivière May (inclusions principalement volcanique) ;
 - En amont de la rivière Çarşamba (inclusions principalement calcaire et chert) ;
 - Au niveau du bassin de Konya ;
 - Non local/ « exotique » (métamorphique, ajout...).
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Introduction

Çatalhöyük was a very large Neolithic and Chalcolithic settlement in Turkey. Situated 11 km north of Çumra in the alluvial Konya plain, it was occupied between 7400 and 6000 BC. The word Çatalhöyük comes from Turkish *Çatal* – fork – and *Höyük* – mound. The site is actually formed by two mounds between which the Çarsamba river runs.

The geology site is quite complex; indeed, an other river play a main role. The May river runs in volcanic areas before joining the Çarsamba at the border of the Konya Basin.

First discovered in 1958, the Çatalhöyük site was brought to worldwide attention by James Mellaart's excavation during the early sixties. Since 1993, the excavations are directed by Ian Hodder and a long-term program was initiated, it includes site excavation, archaeological field survey, and palaeoenvironmental investigations.

It is in this context that the Çatalhöyük Materials Project takes place. Amongst the precious archaeological artefacts discovered during all these years of excavations, ceramics (figurines, stamps, pottery,...) are indeed the most important part.

Ceramic production has always been an empirical art and the choice of raw materials was one of the most important aspect. This project would like to prove the interest of understanding ceramics thanks to the geological knowledges. Indeed, to understand the local raw material base for pottery making, it is important to understand the local surficial geology and pedology as well as the bedrock geology.

The first objective of this study was to do some geochemical analysis of the type of fabric recognised in order to complete and support the petrographic observations. Unfortunately, the SEM broke one month after the beginning of the study and it was impossible to fix it rapidly. That is why this study has been reoriented on a petrographic viewpoint. But although chemical analysis are useful in ceramic studies, thin-section analysis utilising binocular and polarizing microscopes are one of the best method for determining the raw materials, especially tempers.

Moreover the data has been introduced in a first version of a database – proposition for a reference collection of Çatalhöyük pottery fabrics.

This is the first step in order to concentrate the data of the different teams which could help the pottery specialists to understand the provenance of pottery raw materials and in an other dimension, the organisation of the site.

This study is divided in three main points:

- First a short description of the geological and archaeological contexts of the site nowadays will be introduced.
- Followed by some details concerning the Çatalhöyük Materials Project with a presentation of the samples which has been studied and of the methods used in order to determine the provenance.
- And finally, the first conclusions based on the petrographical observations and the geological knowledges of the area around the site will be presented.