ÇATALHÖYÜK 2008 ARCHIVE REPORT

Çatalhöyük Research Project

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Cover – 4040 Shelter Area. Photo Lori Hager

2008 SEASON REVIEW

Hitting the jackpot at Çatalhöyük – Ian Hodder

We have always at Çatalhöyük been working in the shadow of James Mellaart and the exciting discoveries he made at the site in the 1960s. Çatalhöyük is an important Neolithic site near Çumra, Konya. It was inhabited by up to 8000 people who lived in a large 'town'. There were no streets and people moved around on the roof tops and entered their houses through holes in the roofs. Inside their houses people made wonderful art – paintings, reliefs and sculptures – which have survived across the millennia. It was particularly this art that made the site so famous. James Mellaart and his wife Arlette made remarkable discoveries of bull horns attached to plastered bull skulls (bucrania), plaster reliefs, and wonderful paintings, both non-figurative and with complex narrative content.

Since the current project began in 1993, we have been working slowly, using the full suite of latest scientific and forensic techniques to tease apart the activities that took place at the site. We have made some wonderful discoveries, as have been reported in my reports to Anatolian Archaeology over the years. But they always seemed rather less dramatic than those found by the Mellaarts in their larger scale excavations. But in 2008 we began to feel for the first time that we were having a 'Mellaart season'! Suddenly we cam across a burned building that looked very much like what James Mellaart would clearly have called a 'shrine' with well preserved pedestals on which were placed bull horns, and in another building we found paintings.

Figure 1:The new shelter designed by Atölye Mimarlık. Exterior view looking North.

And what is more, these remarkable finds turned up very conveniently under a new shelter that we had constructed in 2007-8 (Figure 1).over the 4040 Area and the previously excavated Building 5 in the northern part of the East Mound. The shelter was designed by Atölye Mimarlik in Istanbul and has been wonderfully successful in protecting the archaeological remains. It is also pleasant to work under and its design fits into the mound and the landscape very well. The ends and sides of the shelter will be covered in the winter months. Over the long term 20 buildings will be placed on display beneath the shelter, allowing visitors and tourists to see a 9000 year old town frozen at a moment in time. The new discoveries are thus already open to the public (Figure 2).

Figure 2: Internal view of the new shelter looking North.

We called the burned house Building 77 (Figure 3). We are still not sure why some buildings were burned, but at least in the case of this building, an intentional fire seems most likely, perhaps as part of a closure ritual. Again for reasons that we do not fully understand, burned buildings (such as Building 52) often have better preserved features within them. Many finds were found on the floors of building 77, beneath the burned rubble, including raptor claws in the side room and antler and ground stone in the main room. Around the northeast platform in this building we found wild bull horns set in pillars. There is evidence that human burials were placed in the platform so the horns seem to surround and perhaps protect the burials. On the wall by these bull horns was a plastered ram's head with horns removed, and below the head there is a small niche. There are other protuberances on the walls of the building, a deep niche in the north wall, and in the northwest corner of the main room there is a very unusual plaster storage or 'cupboard' area. Overall this is a very elaborate building that had long use. There was, in the burned fill of the building, much evidence of collapsed plaster features, and also types of brick and daub that suggest an upper storey.

Figure 3: View of burned Building 77 with wild bull horns on pillars.

Also luckily placed beneath the new shelter was Building 49, which we have been excavating for some years. The excavation is slow because the house was very long lived and contains much detail in its endlessly replaced plaster floors and wall plasters. The building is very small but yet has always been distinctive. It had large numbers of bull horns in its fill, and a deposit of animal figurines below a floor in a storage area. A large number of burials have been found, especially beneath the two northern platforms. Many of these are very distinctive with arms and legs removed in one case, and with heads removed in three cases. A very rich infant burial was also found with stringed copper beads, and surviving cloth. The greatest concentration of burials occurs beneath the northwestern platform and it is around this platform that we found multiple layers of geometric, non-figurative painting. The paintings occurred both on the walls by the platform and around the edges of the platform itself (Figure 4).

In other parts of the area under the new shelter important work was done in understanding the stratigraphical relationships between Building 52 and surrounding buildings, and in linking up the houses north and south of an 'alleyway' that separates two large sectors of housing. It seems too that this 'alleyway' did at times have surfaces on which activities took place, although at other times it was used for refuse discard. In cleaning the buildings on the south side of the 'alleyway' other geometric paintings were found. Overall much work was done preparing the area under the shelter for permanent display.

Figure 4: Painting around the edge of a burial platform.

We had again a large team at Çatalhöyük this summer – 160 researchers and students worked at the site as well as 30 local workforce. As well as the usual Stanford-UK team, and the existing teams from Poland (led by Arek Marciniak and Lech Czerniak) and Istanbul (led by Mihriban Özbaşaran), a team of Selcuk University students worked on the Byzantine and early Islamic burials on the West Mound. Working on the Chalcolithic levels on the West Mound itself, there were two teams – one from SUNY Buffalo and the Free University of Berlin (led by Peter Biehl and Eva Rosenstock) and the other from the University of Thrace at Edirne (led by Burçin Erdoğu).

These teams allowed work to continue on other parts of the East and West Mounds (Figure 5). In the southwest part of the East Mound a team from Istanbul University completed the excavations of another burned house. Beneath the shelter on the south part of the East Mound, Roddy Regan continued to lead the work pursuing a long sequence of buildings and activities. Beneath the 65-56-44-10 sequence of buildings reported on in previous years, and covering the upper part of the sequence at Çatalhöyük, he came down onto a series of smaller and less permanent buildings and open areas. The latter had been used for dumping and for a series of activities including fire-spots. He also found an extremely large oven in an area adjacent to large ovens discovered by Mellaart. Beneath this area of partly open and public activities, we have begun to discern burned buildings that relate to the Level VI burned buildings identified by Mellaart. As noted above, we again expect to find well-preserved houses in this area associated with the burning.

Nearby, in the TP Area, the Polish team from Poznan continued to make exciting discoveries in the uppermost levels of the site. As reported last year, they had found a remarkable incised frieze in a small room. This year it became clear that this room held large numbers of burials, as well as a range of distinctive artifacts such as projectile points. It is possible that this location was used for a long time as a separate 'tomb' – a practice very different from the beneath house floor burials found in the main sequence on the mound. The team has also found large floors that suggest a very different type of architecture emerging at the top of the East Mound.

We can now begin to see how this type of architecture develops into the following Chalcolithic period on the West Mound as a result of the work of the teams from Selcuk, Edirne, SUNY Buffalo and Germany. As well as a deep section dug into the site of the West Mound, Peter Biehl and Eva Rosenstock have identified a series of rooms with internal buttresses. These seem to be located in closely packed buildings with large walls that develop on from the large walls found in the upper layers of the Neolithic East Mound. It seems probable that the buttressed rooms are basements and they recall the architecture at Can Hasan. In another part of the West Mound, Burçin Erdoğu worked further on a building with a red painted floor. The latter seems to have collapsed into a basement room with internal buttresses. Indeed, there seems to be more than one phase of collapsed floor.

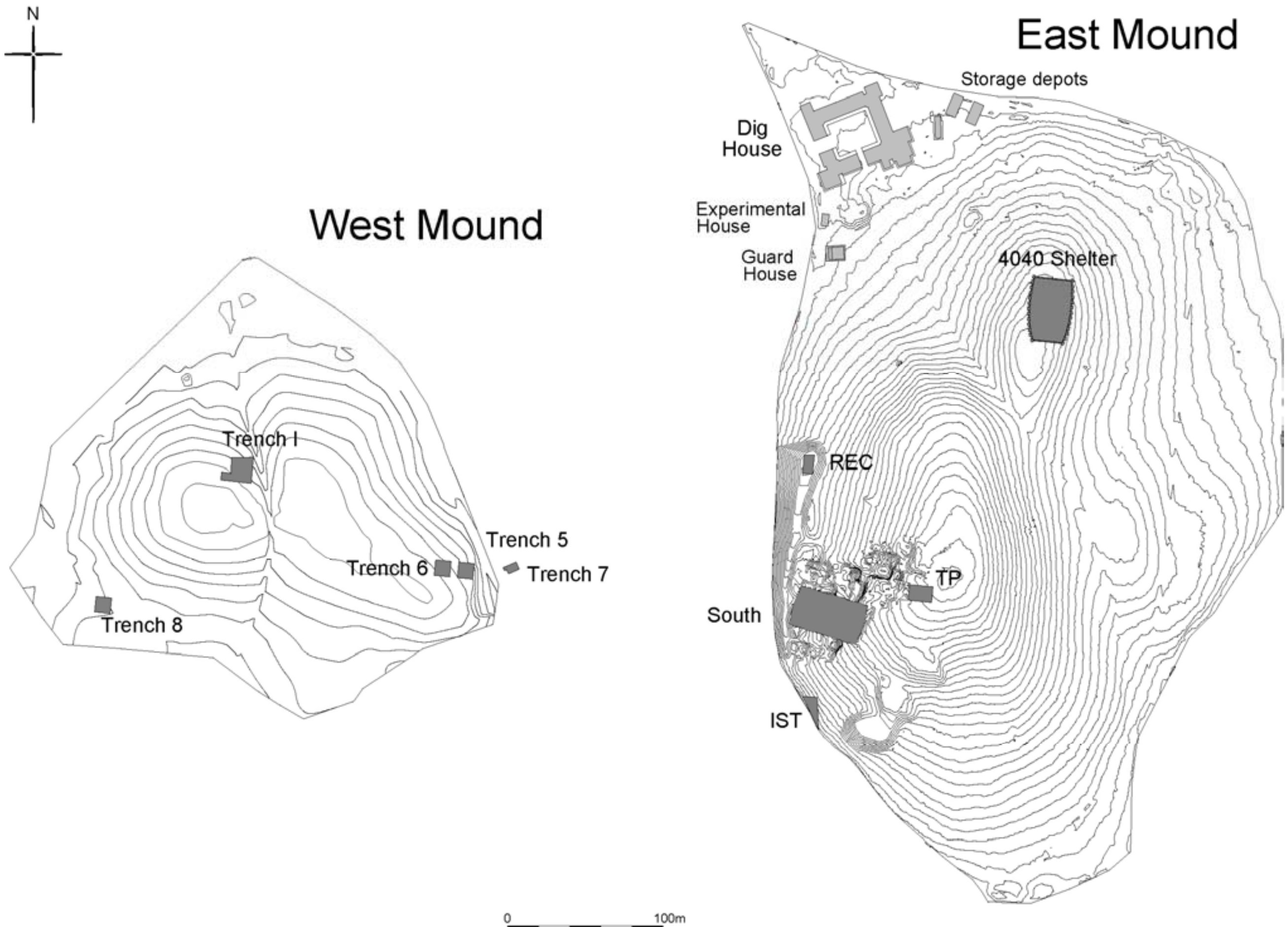

Figure 5: Excavation Areas 2008.

OTHER ACTIVITIES – Ian Hodder & Shahina Farid

4040 Shelter

The shelter project over the 4040 Area was completed just before the summer season this year. The architects Sinan Omacan and Rıdvan Övünç of Atölye Mimarlik in Istanbul worked closely with the excavation team through the design and preparation process, which was planned for completion over a 2-year period. The first part was to lay the foundations in the summer of 2007 followed by the superstructure construction in the spring of 2008.

This new shelter is wonderfully successful in protecting the archaeological remains (see Figures 1 & 2). It has a domed superstructure of compressed wood from Austria and polycarbonate cover panels from France. The ends and sides of the shelter are removable for the summer months when the excavations will continue and closed for the winter months. The structure was assembled by local Konya firms under the supervision of Atölye Mimarlik.

Over the long term about 20 buildings (see Figure 14) will be placed on display beneath the shelter allowing visitors and tourists to see a 9000 year old town frozen at a moment in time.

Karis Eklund, with help from team members, designed a route for a walkway around the area for maximum vantage for our visitors. The route was then made of interlocking wooden planking resting on sandbags to protect the underlying archaeology . Low roped sides keep visitors from straying off the path and information panels have been put at strategic places. (Figure 6).

Figure 6: Construction of public walkway in the 4040 Area

Also incorporated under the shelter is Building 5 (Figure 7). This was the first Neolithic structure we placed on display under a semi-permanent shelter in 1999. We decided to incorporate this building under our new shelter for a number of reasons one of which was due to the sorry state of disrepair of the shelter.

Figure 7: 4040 Area on public display.

Storage Depots

Another major achievement for us this summer was the construction of two storage depots.

One of the problems of long-term excavation is planning for storage of the excavated material archive when no storage facility is available in museums. At Çatalhöyük we have long suffered from a lack of storage facilities at the site. At the beginning and end of each season hundreds of crates of material have to be moved out of laboratories where they are securely stored in the off-season to make room for teams to set up their work stations.


Figure 8: Storage depot 1 with 2nd under construction

Thanks to permissions that were granted last year and much-needed funds, we were able to have two of the four modular storage depots built (Figure 8). The construction work was undertaken by a Konya firm and we are very grateful to Mehmet Ali Özdemir and his team for their hard work and diligence. Many thanks also Ögüz Öztüzcü for the design and plans for the depots.

Disappointingly, the first depot filled very quickly with hardly a dent made in the crates stored in various laboratories whilst the second depot was completed just after the end of the season. Funds permitting the remaining two depots will be built in 2009.

Boeing Sponsored Display Cabinet at Ankara Museum of Anatolian Civilization


Figure 9. Objects from current excavations on display in Ankara Museum of Anatolian Civilization.

With the support of the Ministry of Culture and Tourism and the Konya Archaeological Museum, Boeing sponsored a new display case in the Ankara Museum of Anatolian Civilization for a collection of current finds from the site (Figure 9). This temporary exhibit will be renewed on an annual basis and will allow the finds from the site to be shown in the capital city before returning to Konya. A video about the site is also on a permanent loop near the display case.

Templeton Seminar

The final on-site seminar entitled “Spirituality and religious ritual in the emergence of civilization, Çatalhöyük as a case study” took place at the end of July with an international group of eminent archaeologists, anthropologists, theologians and philosophers to help us interpret the ancient, prehistoric symbolism at Çatalhöyük.

The four questions being asked by the Templeton funded project are: (1) How can archaeologists recognise the spiritual, religious and transcendent in early time periods? (2) Are changes in spiritual life and religious ritual a necessary prelude to the social and economic changes that lead to civilization? (3) Do human forms take on a central role in the spirit world in the early Holocene, and does this centrality lead to new conceptions of human agency that themselves provide the possibility for the domestication of plants and animals? (4) Do violence and death act as the foci of transcendent religious experience during the transitions of the early Holocene in the Near East, and are such themes central to the creation of social life in the first large agglomerations of people?
A final publication is currently in preparation.

On-site x-ray of Building 77 bucrania
One of the exciting finds of this season was Building 77. This was excavated beneath the new shelter over the 4040 Area and was targeted for excavation as it was heavily burnt. This building is now on permanent display.

Because this building was burned, there are many finds preserved within it with elaborate features including platforms. In particular, around the northeast we found wild bullhorns set in pillars. These seem to be 'protecting' the human burials beneath the platform. On the wall by these bull horns was a plastered ram head with horns removed, and below the ram head there is a small niche.

Mellaart found a number of plastered bucrania on walls and set in benches in the 1960s but to date we do not know whether these were made of moulded plaster over the skulls of the animals they imitate.

Figure 10. X-raying the plaster ram head.

Figure 11. X-raying the bull horn core-pillars.

We decided to try to find out and so with the help of our friends in Konya, to whom we are very grateful, a portable x-ray machine was brought to site. Our main interest was the plastered ram head on the wall (Figure 10), but we also x-rayed the bull horn cores (Figure 11). Unfortunately, the resolution of the images was not conclusively informative, as we were x-raying dense soil, but it does appear that there is no internal bone structure to the ram head. The depth of insertion of the horn cores could be seen however, these will be studied in greater detail at a later date in the hope that we might be able to tell if the cores were imbedded with their horn sheath intact, which we think would provide more stability to what seems to be fragile objects.

Visitors
We welcomed a number of organised tours this summer many of whom were generously supportive of the project – Thank you all. These included tours led by the Turkish Cultural Foundation, Stanford Alumni, Sacred Tours and staff from the US Embassy in Ankara, the latter expertly organised by Sally Collins, formerly a member of our Human Anthropological team. Thank you Sally!

We were also very happy to host a group of representatives from our long-term supporter, Shell, who were on a working tour in Konya. As well, we were visited by a delegation of sugar manufacturers who were attending an International Conference at the Sugar Factory in Çumra. We were pleased to host our British Ambassador Nick Baird and his wife Caroline and the Irish Ambassador Tony Mannix and his wife Roisin. Many guests were also recommended to pay us a visit via the Dedeman Hotel in Konya. We are very appreciative of the many ways in which the hotel supports the project and team throughout the season.

We were filmed for a TV documentary about the evolution of the human diet, which is currently in production.

The Summer School was once again a huge success. This programme's success is proved by the fact that it has taken place on a seasonal basis since 2002 when it developed from an EU funded programme to promote the education of archaeology in schools. It involves up to 20 children from schools, clubs and orphanages visiting the site every day over a month of the summer season (Figure 12). 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. But what appears to be the highlight of the day for the children is excavating on the 1960s spoil heap.

The programme develops year by year and now involves schools from all over Turkey, as far as Istanbul. This year students from the Koc High School in Istanbul spent a day with us. This naturally feeds into the local economy through hotel bookings and tours to other attractions in the Konya region. The programme is directed by Gülay Sert and supported by Shell.

Figure 12: Community Collaboration – Summer School and Village visiting day.

Another important way of reaching our community is via a programme aimed to understand our relationship with the local communities and what they require from us in order to better understand our shared heritage and responsibility to it. We believe we need to expand the concept of 'the archaeological site' to include research questions that meet community needs. We do this through interviews, discussions, presentations and questionnaires, which takes place in the focus villages and on site.

Towards the end of the season we invite everyone from one of the villages to a community night at the site. This year about 500 people came from the village of Küçükköy for site tours, slide shows and workshops followed by a feast of rice and lamb washed down with copious amounts of Fanta in the courtyard of our dighouse (Figure 12).

Figure 13: Part y in the dighouse courtyard.

ACKNOWLEDGEMENTS

The project works under the auspices of the British Institute of Archaeology at Ankara, with a permit from the Turkish Ministry of Culture and Tourism. The project is grateful to the Director General of Monuments and Museums, Orhan Düzgün and to our temsilci Lütfi Önel.

The main sponsors are Yapi Kredi and Boeing. Our long term sponsors are Shell and Merko, and other sponsor is Thames Water. Our main institutional partner and sponsor is Selcuk University. In Britain support has been provided by the British Institute of Archaeology at Ankara, and University College London. In America funding has been received from the John Templeton Foundation, the Global Heritage Fund, National Geographic, Stanford University, the Turkish Cultural Foundation, the American Embassy in Ankara. In Poland thanks are due to the University of Poznan, and the Polish Heritage Council.

The other institutional partners of the project are Selcuk University, Stanford University, University College London, Poznan University, Istanbul University.

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Survey and Digitising:	Dave Mackie, Cordelia Hall in consultation with Duncan Lees (Plowman Craven).
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Heavy Residue:	Milena Vasic.
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Residue Sorters:	Saliha Sivas, Fadimana Yaşlı, Rabia Yaşlı, Elmas Motuk, Esra Şener, Emine Yaşlı, Hatice Çelik, , Elmas Şener.

EXCAVATIONS

Introduction to the Excavation Areas – Shahina Farid

Excavation took place in four areas on the East mound and in three trenches on the West mound (Figure 5). The four areas on the East mound were the 4040 Area, an area that was scraped in 2003 on the northern eminence of the mound and now partially under a permanent shelter completed this summer, 2008; the South Area, an area excavated since 1995, incorporating the 1960s trenches and covered by a shelter constructed in 2002; the TP Area, an area excavated since 2001 at the crest of the mound; and the IST Area on the lower southwest slope, south of the South Area.

On the West Mound excavation continued in Trenches 5, 7 and 8

Teams work with specific aims and research questions as outlined below.

4040 and South Area Teams

Under direction of the Project, excavation teams in the 4040 and South Areas comprise professional excavators assisted by members of field schools from collaborative universities and international students. The aim is for students to work along side professional excavators to gain a good and thorough grounding in excavation skills, recording and integrated interpretation. Excavation teams are therefore grouped based on experience with specific aims for the seasons work.

5-year excavation programme

In terms of the excavation programme the research aims for the current phase of the project (2003-8) deal with the social geography of the settlement and larger community structure. We aim to answer questions on: how were production, social relations and art organised beyond the domestic unit? How did this organisation develop over time? Does the social geography of Çatalhöyük involve groups of houses clustered around dominant houses or is all social and economic life decentralised and based on equivalent domestic units of production?

In order to address these questions we moved away from detailed analyses of individual buildings, their construction, occupation and closure, which were the focus of the previous 5-year phase of work (1995-99, see published volumes), and we concentrated on large 'neighbourhood' areas.

4040 Area

Thus the 4040 Area to the north of the east mound was scraped in 2003 and integrated with the area exposed by surface scraping in 1993-5. The subsequent plan exposed a large number of similarly aligned groups of Neolithic houses separated by 'streets' or 'alleyways'. Subsequent excavations have established that these groups of buildings represent different time periods.

The long-term aim is to excavate some twenty houses of a contemporary occupation horizon for permanent display under a newly constructed shelter that will be open to visitors throughout the year as well as an area where archaeologists can continue excavating in the summer months.

South Area

To compliment our research aims in the 4040 Area covering contemporary neighbourhoods, in the South we aim to explore more fully the temporal processes that produce phases of settlement because the buildings remaining from the Mellaart and our excavations occur at different levels. Thus it is possible to examine the chronological development of houses in relation to each other from the very base of the mound. We also work towards expanding the area where we reached natural lake marl in 1999. This requires strategic planning of where and to what depth to excavate in order to achieve this in a safe and coherent manner. The trench where natural was reached in 1999 falls in the centre of the South Area. In order to extend this trench we need to excavate surrounding structures in a stepped manner. Therefore, in order to reach our 'natural' target we have first to move further away from that focal point, but whilst doing so we will be fulfilling the aim of excavating a temporal sequence.

TP Area

The team from Poland, headed by Professors Lech Czerniak and Arkadiusz Marciniak from the Institute of Archaeology and Ethnology, Polish Academy of Sciences and the Institute of Prehistory, University of Poznań direct a team of students from Poland. The TP team have worked in an area at the southern crest of the East mound since 2001 to study the latest phases of tell occupation, dated to the end of the seventh millennium BC which is located next to the 1961 trench where James Mellaart had defined Levels I – III.

The team continued excavations at the highest point of the East Mound. This area was targeted to investigate the latest levels of the site, which were neither represented in current excavations on the northern eminence of the mound nor in the South Area. TP Area is located immediately to the east of where Mellaart had excavated Levels I-IV. The area proved to be heavily utilised in the historic period, which sealed the latest Neolithic levels identified as Levels 0 – II by linking the TP trench with the 1960s trench The aim is to continue to explore the later Neolithic sequence expanding westwards. The study of these later periods is providing significant data for the transition of Neolithic to Chalcolithic at Çatalhöyük and thus providing a link for the East and West mounds.

IST Area

Team IST is mainly comprised of members and students from the University of Istanbul, Department of Archaeology, Prehistory Section under the direction of Assoc. Prof. Dr. Mihriban Özbaşaran.

Team IST has formerly excavated sites in Central and Southeast Anatolia. Since 1989, its members have been working at Asikli Höyük and Musular, the two Aceramic Neolithic sites located in the east part of Central Anatolia - west Cappadocia and are currently excavating the site of Akarçay Tepe in SE Turkey. Aşıklı and Musular, respectively, are the predecessors of Çatalhöyük in chronological terms. Aşıklı is radiocarbon dated to the 9th-8th mill. and the latter to the 8th-7th mill. BC. With such a background, Team IST wished to focus on the early/earliest development of the site at Çatalhöyük. The most promising and suitable area to fulfil this objective was the lower south-western slope of the mound. Excavations to date however, have placed the IST sequence of structures in the middle occupation sequence at Çatalhöyük (roughly Levels IV – VI based on the ceramic and chipped stone technology). Here the team have excavated a series of buildings and external areas up to the site perimeter fence, which clearly indicates that the sequence lies below a public dirt track that runs between the East and West Mounds.

West Mound

Excavations took place on the West mound between 1998 – 2003 under the direction of Drs. Jonathan Last and Catriona Gibson. Their aim had been to locate and reassess the 1960s trenches and to conduct excavation in so far as to establish the potential of the site. The results, in preparation for publication, have produced exciting and important data in terms of the transition of the Neolithic to Chalcolithic at Çatalhöyük. The gap of c.800 years between the last Neolithic activity on the East mound and the occupation of the West mound as had been interpreted in the 1960s has already been closed to c.200 years based on the data collected from the West Mound excavations and the TP Area on the East mound. It is probable that we will find a seamless continuity between the two mounds.

In 2006 a joint team under the leadership of Dr. Peter Biehl from the University of Cambridge and Dr Burçin Erdogu from the University of Thrace began excavations in two trenches (T5 and T6) on the eastern slope.

The results of the 2006 season defined a new three-fold research approach for the West Mound excavations. It was decided that the new excavations would approach a two fold Chalcolithic research agenda and the third would excavate the Classical and later periods.

Trenches 5, 6 and 7
Led by Dr. Peter Biehl, SUNY Buffalo & Dr. Eva Rosenstock, Free University, the aim in Trenches 5, 6 and 7, located on the SE slope of the mound, is to excavate a series of step trenches down to natural in order to assess a full sequence of occupation on the West Chalcolithic mound. Continuing from Trs. 5 and 6 opened in 2006, Tr. 7 was opened on the same alignment but as a machine cut trench in the side of a ditch that runs along the eastern edge of the West Mound. This was opened to afford a quick view into the depth and nature of the stratigraphy.

The results combined with those from the TP Area on the East mound will inform on the nature of transition from Late Neolithic on the East Mound to Early Chalcolithic on the West Mound or, illustrate that the two sites were at some stage occupied concurrently.

Trench 8
The team led by Dr Burçin Erdogu, University of Thrace is investigating an area to the southwest of the mound where later surface collections of pottery indicated ECII activity in order to correlate occupation sequences on Çatalhöyük West to Can Hasan.

When Çatalhöyük West mound was first excavated in two small trial trenches (I and II) in the 1960s, on the basis of the pottery the occupation sequence was divided into two phases - Early Chalcolithic I (EC I) and Early Chalcolithic II (ECII). EC II was represented by a series of pits in trench II on the southwest part of the site and pottery similar to EC II was noted as Can Hasan I, phase 2B. The aim is to investigate the EC II occupation at Catalhöyük West, to explore how EC II occupation developed after the end of EC I occupation, and how to contextualize the transition from EC I (c.a. 6000-5700 cal BC) to EC II (c.a. 5700-5500 cal BC).

Classical and Later Activity
The third team led by Drs Ahmet Tırpan and Asuman Baldıran from Selçuk University are conducting excavations of the later activity. It is known that the West Mound was used as a burial ground in the historic periods but so far little by way of occupation or other activity has been found. The Selçuk University team is concentrating on the excavations of the late burials and any other activity in Trenches 5, 6, 7 and 8. This will enable the team to view a much wider and meaningful late burial assemblage in a holistic manner.

A review of the Mellaart Level system and the introduction of a new phasing system at Çatalhöyük 2008 – Shahina Farid

Introduction
Since the onset of excavations in the South Area in 1995 (formerly known as the Mell and Summit Areas), it was suspected that Mellaart's phasing of structures into Levels was not entirely chronological. However, it has not been possible to test that misgiving until the 2008 season when we came closer to a stratigraphic link between the upper area (the B.10-75 sequence – formerly Summit Area) and the lower excavations (formerly Mell Area).

The Level system
As each superimposed building was excavated it was attributed to a site stratification system called a 'Level'. Mellaart defined fifteen separate superimposed building Levels numbered 0 at the top (located near the current TP Area), to XIII (in the deep sounding of the South Area [Farid 2007. Chapter 3]). These numeric levels therefore, represented the location of a building withn a stack or column of buildings, that is, a Level V building is the fifth down in a column of thirteen possible building phases.

Horizontally buildings were assigned to levels on the basis of their abutting or neighbouring positions implying that buildings lying side by side were all standing at the same time. No account was made of the sequence of individual building construction within a level. Current work has shown that in most cases neighbouring buildings can have been occupied contemporaneously at some stage through the life cycle of buildings but that the construction event is building specific. That is, there may be a decade or few, or less, between constructions across one level. We have also established that a Level IX building may be in use when a Level VIII building is constructed against it (Farid 2007. Chapter 7).

The order of construction across a level can be determined but generally only if and when the walls of a building are excavated. In current excavations walls are not excavated often enough. This is due for a number of reasons, some of which are research led and some due to the logistics of excavation.

So, the sequential order of construction and occupation within a level was not routinely addressed in the 1960s excavations.

Overlaying Plans

The area under excavation in the 1960s expanded westwards as each layer of buildings was excavated on the slope of the SW flank of the mound. Thus the area excavated at the top of the mound expanded from c.10 x 15m at Level I to c.20 x 32m at Level III and so on. The stratigraphic relationship of each level of buildings was maintained by a wide margin of superimposed buildings.

However, through a plan regression exercise (Mellaart 19662-1966) we can see that this overlap was inadequate between Level IV to V. Here the link between one level and the next was made via a single unexcavated court (midden). This is an inadequate relationship as middens are particularly stratigraphically unreliable; the duration of their use cycle can overlap several building phases and include secondary and tertiary depositions. Furthermore phasing middens to buildings is not easily traced during excavation and is often dependant on the excavation methodology. For the most reliable phasing results the whole of a midden area needs to be released and clearly demarcated by the surrounding buildings structures. In practice this is difficult as the Limit of Excavation often bisects middens. Even then it is difficult to trace the subtleties of the finely lensed interdigitated depositions as these deposits are often of similarly composed material cast from different directions.

Our experience has illustrated that the best way to excavate middens is a combination of ‘in plan’ and ‘by section’ excavation such as in the South Area (see for example Regan et al this report in relation to the B.10 – B.75 sequence and see Figure 41). Here we have related middens to the successive B.10 – B.75 building phases. However it has to be noted that even in this case we have only related the midden deposits to the buildings listed and not to other neighbouring buildings that lie outside of our excavation area.

Comparison of Heights.

Various checks were implemented over the summer season 2008 (Farid, Hall & Hodder) to correlate 1960s’ heights recorded on the floors of published plans with current project heights taken from buildings that Mellaart had left in situ. Little is known of the 1960s datum but we could establish that a consistent datum was used throughout. Heights were compared through as many buildings as was possible but the difference was inconsistent. The best correlation indicated that the levels could not be relied upon as in some cases buildings shown on different level plans had the same height, particularly those of Level VI A and B. This suggests that two phases in Level VI was inconsistent; present in some locations but not everywhere.

In principal Mellaarts phasing into levels would have worked had there been a rigorous stratigraphic sequence of successive buildings, and an explicit recognition and explanation that a level represented a broadly contemporary horizon of buildings.

Problems of Inter Area Phasing

Whilst phasing of stratigraphically secure successive buildings works within a single area of excavation, there are problems when relating to other areas across the mound that bear no stratigraphic relation to one another.

In such situations it is common practice to correlate periods or phases across unconnected excavation areas through the material or environmental culture, which should display a chronological change in technology, innovation and resources used.

But this exercise is not so easy on a site such as Neolithic Çatalhöyük where the sequence of human activity is a continuum of over 1000 years and where subtle changes occurred through time. Furthermore, for now, the only material that indicates any change is the pottery and the chipped stone assemblages.

So the material culture excavated in the 1960s was linked to buildings and these buildings were phased within levels. We adopted this chronology using the pottery and chipped stone to correlate the different areas that we excavated across the mound to Mellaart's Levels.

Problems in using the 1960s material as a dating tool

Thus, Building 1 in the North Area was dated to c. Level VI – VII based on the pottery and chipped stone assemblage. B.1 was constructed directly over Building 5 with no hiatus and therefore phased to Level VII-VIII. Building 3 (BACH) was tentatively phased with B.1 and B.5 as it lay on a comparable horizon.

The allocation to a mid occupation of the mound sequence in B.1/B.5 led to work conducted by Neil Roberts and his team to investigate how much of the site might have been lost through erosion since the Neolithic. (Roberts et al 2007). The work concluded that whilst erosion has occurred, it was unlikely that this Northern prominence was as intensely occupied through the later periods as Mellaarts excavation area on the SW flank of the mound. This also supported the hypothesis made from the surface scrape work conducted in 1993-94 (Matthews R. 1996), as well as the identification of later Levels (II – III) on the eastern lower skirt of the mound (pers. comm. J. Last). These results confirmed that different parts of the mound were occupied at different times through the Neolithic.

This is further illustrated in the excavations of the IST Area on the lower flank of the East mound, south of the South Area. Excavations were targeted here for buildings of Levels VIII and earlier but the material assemblage, based on Mellaart's chronology, points to buildings of c. Levels IV – VI.

Thus we have established that different locations were occupied at different times and that the sequence higher up the mound is not necessarily later than that located lower down the slope of the mound. This may account for the overall undulatory shape of the Neolithic mound.

A final note of caution is that we cannot assume that the above and below relationship of buildings is temporally continuous; these relationships have to be proved. Whilst we know that the Neolithic strata is regularly truncated at closure phase of buildings we are able to prove that the new construction is a continuous event to it. We have identified breaks in a sequence; when a building is abandoned (eg B.2) as well as exercises in landscaping of external areas and middens. But the detection of these temporal hiatus' can at times be difficult to identify.

A reliable sequence for a chronology of material assemblage is therefore necessary as part of the tool set to reinforce the excavation data in phasing the site.

Problem 1. The 1960s Level phasing is best described as a blanket phase and one that does not address the nuances of the temporal sequence of buildings and material culture.

Problem 2. The continuity of levels is unreliable between Levels III – V and therefore current work cannot be correlated to Mellaart's phasing.

Problem 3. Phasing across areas is based on the material chronology defined by Mellaart's levels allocation.

Problem 4. We have established that different areas were occupied at different times across the mound.

Problem 5. The issue of which buildings were standing and occupied at the same time.

We are attempting to address this problem by identifying continuous strands of buildings by area and introducing a bespoke area phasing. The material data from these different phasing strands will then be cross-compared in the hope that a site wide chronology can be determined.

Finally our material chronology will then be compared to Mellaart's.

New Phasing Tool
The introduction for a new phasing system has been under discussion for some years but was finally ready for introduction because of the work completed in the 2008 season (Regan et al this report).

Our new phasing will be based on a single stack or column of buildings, which we can constructively demonstrate as sequential in time. It will be based on best fit stratigraphical relationships, which have been excavated by the current team. The 1960s data will only be drawn upon where no other option exists. In some cases abutting relationships will have to be used.

A phased strand will be area specific and determined by the local stratigraphy.

The main strands will be represented in the South and TP Areas, which should span the complete Neolithic sequence. A third strand will be introduced in the 4040 Area and others will follow as sequences are defined.

The phasing will be area specific referred to as an alpha suffix to the area eg. South.L or TP.K and so on (the sequence starts in the middle of the alphabet to allow for additions at either end).

In addition the South and TP strands will be used as the spines for a new set of C14 dating (Bayliss & Farid 2007).

Recording Phases
Currently Mellaart's level allocation is logged on the Space Sheets of the excavation database. This is because all excavated deposits are linked to spaces (rooms within a building, external areas, between wall gaps), but not all spaces belong to a building (a building is only assigned when we are certain that one or more spaces are part of one building).

A new field will be added to the phasing section of the Space Sheet where the alphabetical phase suffixed to the area name will be entered. If a correlation with a Mellaart level exists it will remain visible to avoid confusion and also to retain this historic information. But if there is no correlation only one or the other will be indicated.

Back ground to South Area phasing issues
Between 1993 - 94 the 1960s trenches were re opened by the current team One of the aims was to correlate the eroded in situ remains with Mellaart's published data (Matthews & Farid 1996) thus allowing continuity between the two campaigns. It was however; through this work that the team realised there was a disparity between the numbers of levels represented in Section 7 (the large eastern section through Mellaart's Area E – ref Matthews/ page) and levels that were exposed in plan.

On his lower terrace (at the base of Section 7) Mellaart had largely excavated to Level VII from where smaller targeted areas were excavated deeper into the sequence (eg. Shrines 1, 8 and 10 and 29 sequences). So, when excavations were reopened in the Mell Area in 1995 we were primarily dealing with Level VII and earlier. Here the level phasing worked so there was no need to adopt a new system. More importantly we were handicapped in addressing the Section 7 discrepancy until this section was fully excavated to the Level VII horizon.

In 1996 excavations began at the top of Section 7 known then as the Summit Area. The aim was to reach the heavily burnt building recorded as East of VII.32 in Section 7 (now numbered Building 80). Working with the phasing as extrapolated by Matthews, placed the latest building at the top (B.10) with Level III, therefore B.44 as Level IV, B.56 as Level V and B.65 as Level VIA. B.75 therefore would have been Level VIB thus reaching the burnt building, B.80 as Level VII.

Based on the 2008 seasons work it appears that B.80 is Level VI and that in this location there is no division into Level VIA and B. This places B.75 at Level V, which conveniently is the level at which Mellaart defined his large oven phase. Using this phasing B.10 is placed at Level 1, which is at odds with Mellaarts Level I at the crest of the mound.

Finally the upper and lower have almost connected and we feel ready to introduce a new phasing.

The New phasing strands

South Area (Figure 49)
The following describes the most reliable accessible stratigraphic strand through the South Area, how each phase relates to the next, and the inherent uncertainties and assumptions. Our strand is in red on the building matrix.

From the base of the mound we have a continuous stratigraphic sequence from Space 181 (Pre XII middens) to B.22/B.16 (Level IX), which have been either completely or partially excavated by the current team.

The buildings above were excavated in the 1960s and therefore provide no phasing material for our exercise.

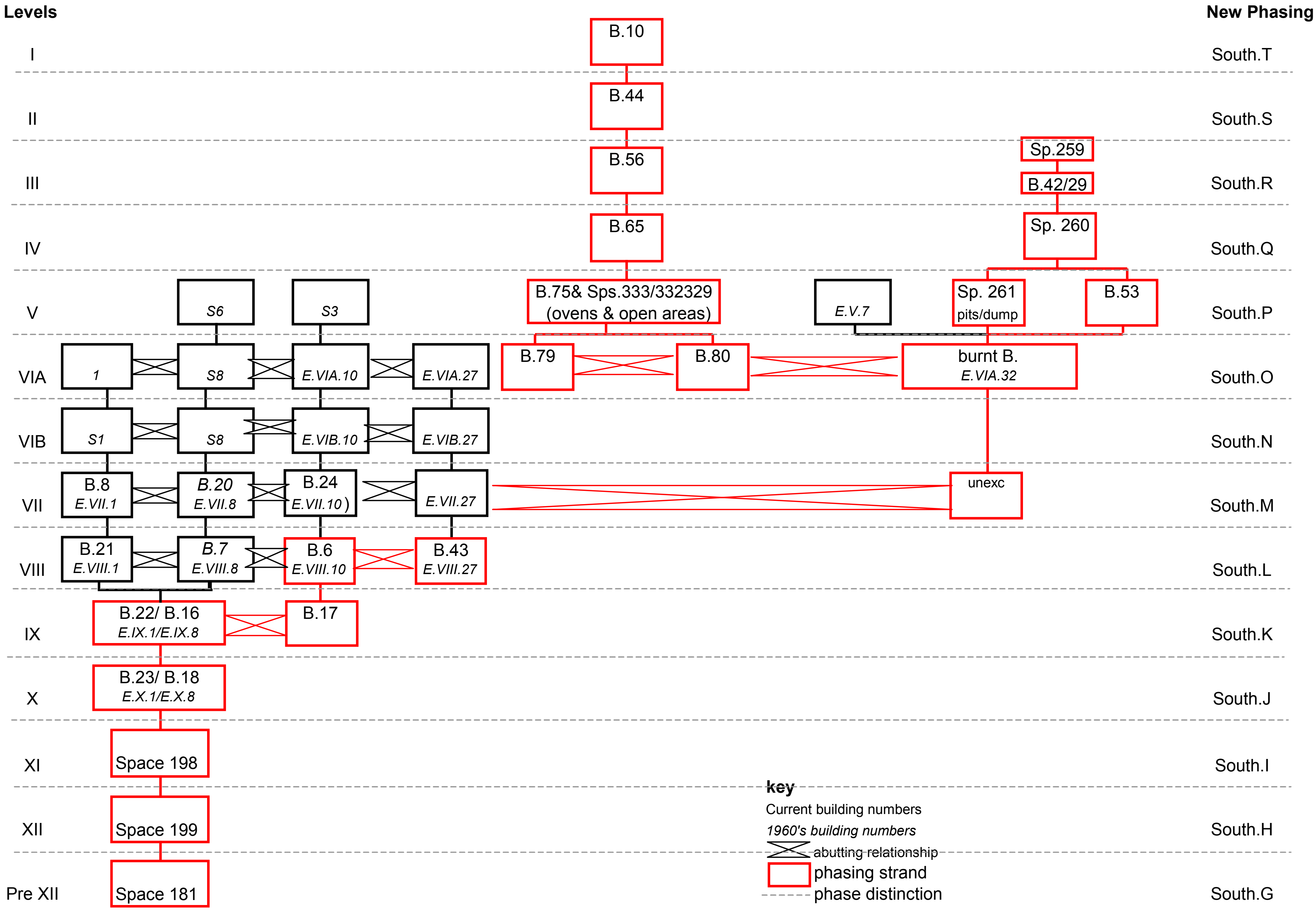
Therefore from B.22/B.16 we side step to B.17.The best this relationship can afford is its likely occupation contemporaniety through its abutting relationship.

B.17 is overlain by B.6. The overlying sequence was excavated as Mellaart's Shrine 10 sequence and therefore provides no phasing material for our exercise.

So from B.6 we sidestep to B.43, this too is a possible occupation contemporary structure through its abutting relationship.

B.43 was exposed to its latest occupation phase as E.VIII.27 in the 1960s, which we have only partially excavated. The above building phases were like wise excavated. The only link to where current excavations can pick up the sequence is via the southern wall of Level VII (E.VII.27).

South Area phasing strand



The southern wall retains unexcavated deposits to its south, which were exposed in plan in 2008 (Figure 50). Over this horizon lie the burnt remains of a building that has been identified as E.VIA.32. This E.VIA.32 abuts B.80, the burnt building that was recorded in Section 7 as East of VII.32 and the building over which the B.75 – B.10 lie.

Figure 50: Location of South Area phasing

At this same horizon we are able to link B.53 and its later sequence which includes B.42/29 from where the painted plaster skull was found in a burial context.

This is the only area which will afford us a stratigraphic link to the B.75 – B.10 sequence and is therefore targeted for excavation in 2009. Until then the relationships are unclear and our identified strand may therefore have to be modified.

4040 Area

In the 4040 Area we have less vertical stratigraphic relationships, as the aim was concentrated on horizontal exposure to expose a contemporary neighbourhood rather than the temporal sequence (see figure 12 Farid 2005). As noted previously abutting relationships are inherent with problems when addressing the sequence of individual building construction. Furthermore the excavation strategy in the 4040 Area from 2003 – 2006 (Farid 2006), plus the relocation of the position of the 4040 Shelter (Hodder & Farid 2007), has resulted in areas of unexcavated structures between groups of excavated buildings. Both of these factors pose a problem in phasing or identifying a strand of sequential building phase.

We have discrete clusters of phased structures. Some of these represent structural extensions, modifications and structural supports as oppose to whole building phases that we are accustomed to. Furthermore there is little primary material with which to build a chronology of artefacts from these structural episodes.

The following outlines the sequence by cluster of buildings and illustrates the problem of introducing a single strand.

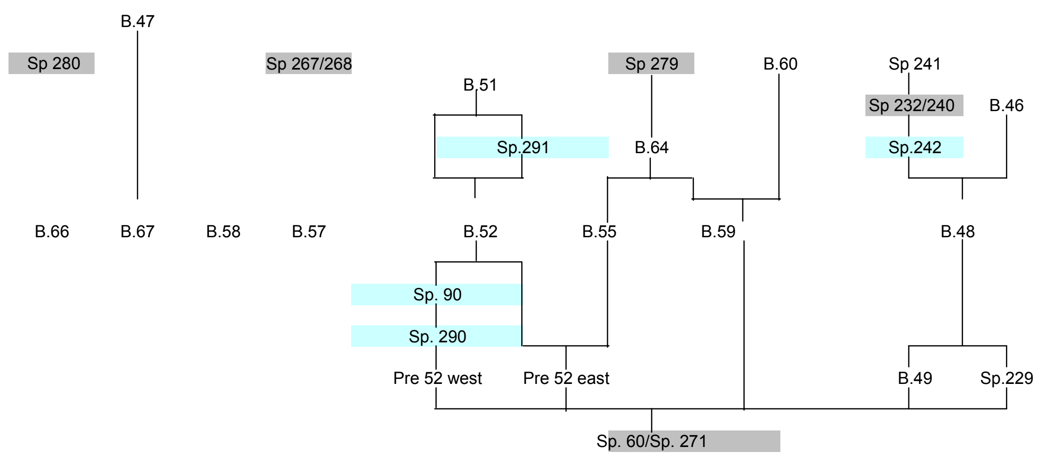
<u>Building 1/Building 5.</u>
Building 1 was constructed directly over Building 5.
Although eroded due to its location at the surface of the mound, B.1 was fully excavated with overall good dating material.

Building 5 is demonstrably earlier than B.1 but only the infill was fully excavated to its latest occupation phase, as such there is sparse dating material.

Building 3
Building 3 (BACH) was tentatively phased with B.1 and B.5 as it lay on a comparable horizon. This was fully excavated, although as B.1 suffered surface erosion. It provides good dating material but is not stratigraphically linked.

Building 77
Building 77 has been excavated in isolation. It could be phased along with B1 or B.5 due to its physical location but it is not stratigraphically related. This burnt building has produced a substantial amount of in situ materials for chronology.

Central cluster (Figure 53)



This is the central cluster of buildings and associated external/midden areas in the 4040 Area but lies to the south of the sheltered area. It appears to have consisted of a number of small buildings, which in the central area were modified into larger structures through extensions into external areas, knocking in walls and the construction of external support walls (Yeomans & Mackie, this Report). A major issue is how to phase these modifications as they do not represent building phases as we are accustomed to nor do they provide adequate material assemblages for comparative study.

As a group this is an interesting set of buildings. Small in comparison to those that bound them to the north and south and yet elaborate and long lived (B.49, B.52?). They appear to have opportunistically expanded outwards as the surrounding 'vacant' plots allowed, rather than upwards? Interestingly Building 59 also extended into a vacant area (Space **). If this structural configuration is a reflection of the social density across the settlement then the South Area appears crowded.

Central to this area is the Building 52 sequence.

Pre B.52 there appear to be two buildings, Pre B.52 East and Pre B.52 West.

Figure 51: View of central cluster of excavated structures

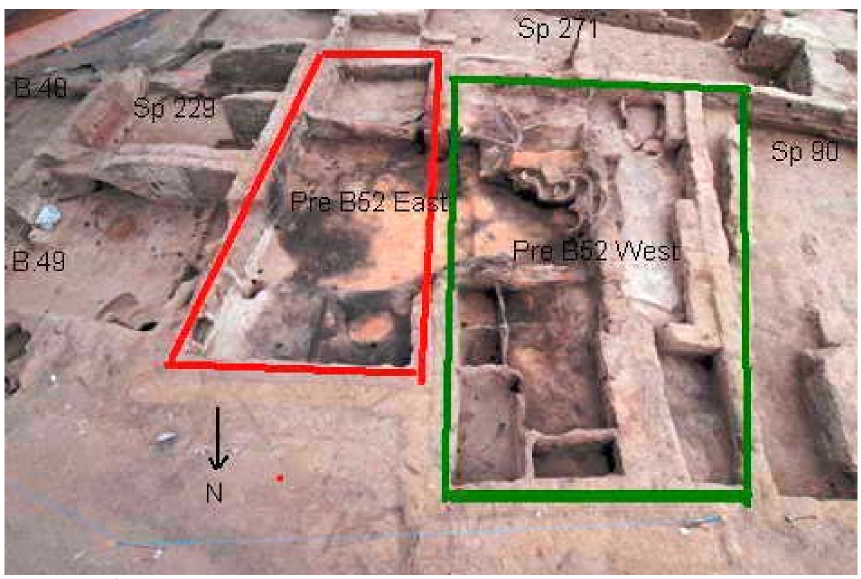


Figure 52: Pre B.52 E & Pre B.52 W

The western length of Pre 52 West appears to have been modified (Spaces 91 and 92) and closed off but an extension added to its south as Space 290 encroaching into the external Space 271.

Later, Pre B.52 West was again modified by incorporating an external area Space 90 which was infilled with secondary midden deposits that provided no indication of function.

Then it appears that B.52 was created by knocking through the walls of Pre B.52 West and Pre B.52 East. This may have been followed by another extension to the south as Space 291 (note that this was previously numbered as Sp. 254), which once again encroached into

Space 271. It is suggested that when Space 291 was created Spaces 91 and 92 may have come into use again.

An alternative scenario is that with the creation of B.52 Spaces 255 and 290, 91 and 92 became redundant and infilled. This is because the infill in these spaces was not burnt like the B.52 infill. This has always been a dilemma and one that continues. But such a sequence contradicts the phasing of the creation of B.291.

Finally, B.52 burnt down and B.51 was constructed within the footprint of the original Pre B.52 East.

The above sequence has been interpreted by discrete investigatory excavations only and not by the excavation of structural elements or occupation sequences. As such this is not an ideal analysis. Furthermore it has not provided primary material data. Lying to the east of Pre B.52 East are Building 49 and Space 229. To the east of these two structures lies B.48. I propose that B.48 postdates B.49 and Sp 229 in construction, simply on the basis that its floor horizon is higher than B.49 and Sp 229 and that its alignment in length straddles the two aforementioned structures. This positioning however, could be dictated by a similarly aligned earlier building. B.48 and Sp 229 were probably co occupied at some time, suggested by the position of their ovens, which were built into the external area where middens presumably accumulated against them (for similar setting see oven F. *** B.4). A gap between the south wall of B.48 and Space 242 suggests that the construction of this strange structure (Sp 242) was later and accommodated the B.48 oven.

A review of the 2004 data should clarify whether there is hiatus in accumulation of midden to the south which post dates the closure of Sp 229. This relationship might be possible to understand through the relationship of the middens and the oven. None the less it is interesting to note that this oven was left to collapse rather than being preserved by backfilling (ref archive report as in B.4, B.58, B.57).

Overlying Sp 271 midden to the east was midden represented as Space 232/240 which sealed Sp 242 and appears to correspond with the construction of Sp 291. A heavily eroded Space 241 was then constructed over Space 232/240

Please note that this is on going work. Refinement of external area/midden deposits by unit requires detail analysis which is due to be undertaken in the study season. This will clarify the finer stratigraphic relations of each deposit to the structural modifications. This will then afford the reallocation of some units to different spaces associated with different construction events.

To the south of Space 271, which is equivalent to Space 60 we have established that B.55 was constructed later than Pre B52 East.

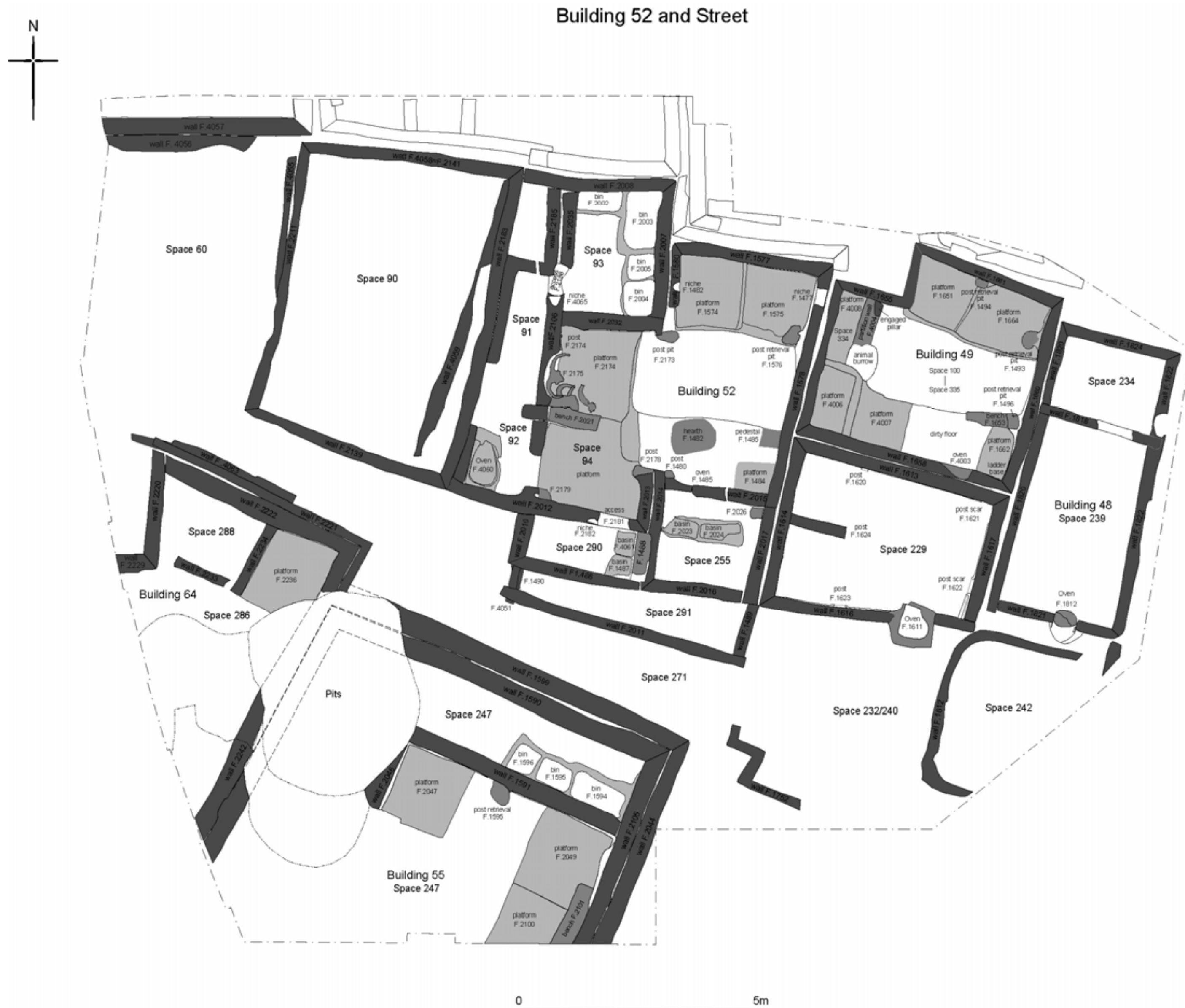


Figure 53: Plan of central cluster of structures for phasing

External to the Shelter
The following buildings all abut one another:

B.59 – Fully excavated down to outline and infilling of earlier building. Walls not removed. Sparse material for chronology.

B.64 - Excavated of infill only. Post infilling the area was cut by pits which were backfilled with midden (Pit (13148, McCann 2007)). Dateable from infill of pits only.

B.66 – Released in plan only. Not further excavated.

B.55 – Excavated to last occupation phase. Sparse material for chronology.

B.57 – Excavated to last occupation phase. Sparse material for chronology.

B.58 – Excavated to last occupation phase where some work was done on the occupation deposits. Rich closure deposits, especially faunal remains interpreted as primary deposition.

B.67 - Excavated to last occupation phase. Sparse material for chronology.

Within this group a few sequences have been established:

B.55 is constructed later than Pre B52 E as the middens that it is founded on abut the southern wall of Space 255 of Pre B52 E.

Building 64 lies between B.55 (east) and B.59 (west). We propose that B.64 is later in construction than B.59 and B.55 This is on the premise of its odd shape slotting into a pre determined space. We know from the pit sections through this area that there is a similarly aligned earlier building, so this plot has history. It seems likely that B.64 was contemporary in occupation with its neighbours at some stage.

Heavily eroded B.60 was constructed directly over B.59.

· B.58 and B.67 were contemporary at some stage as there was a common opening between the two structures but the construction event may have differed.

· B.67 was overlain by B.47 but there may have been a considerable hiatus between the two based on the very different architecture we see in B.47.

Midden spaces Sp.279, Sp.280, Sp.267/268 postdate B.64, B.66 and B.55.

So, at present, there is no single stratigraphic strand in the 4040 Area which is sufficiently robust to act as the spine of the phasing sequence in this area. For this reason, it will be necessary to correlate finds assemblages, principally pottery and chipped stone, from here to the phasing scheme in the South or TP Area.

TP Area
The TP Area was opened at the crest of the mound close to Mellaart's initial excavations in Area A. The aim was to link with Mellaarts trench where Levels 0 – III were identified thereby securing a phasing for the later phases of the settlement.

Whilst the TP excavations have reached Mellaart's eroded wall remains there are a number of anomalies that lead us to believe that TP represents phases much later than Levels I – III, especially in relation to the South Area.

To date the TP excavations have produced very different architecture. Whilst continuity can be seen in some elements there seem to be more differences represented by pebbled plaster floors, different types of oven/hearths and more strikingly, the difference in burial practices. Are we seeing more in common with the West Mound here?

The TP phasing strand is still under analysis but will be very interesting for phasing the later sequence on the Neolithic Mound and connect to the Chalcolithic West Mound.

A final word on burning.

In 2008 we added B.77, 4040 Area and B.80 in the South Area to our group of burnt buildings (ref archive report).

If B.77 is phased with or near B.1/B.5 is placed to the mid sequence (Level VI – VII?), similar in phase to B.80 which abuts a burnt building B.79 to its east and burnt building E.VIA.32 to the west.

An emerging pattern is that all the burnt buildings reported on (ref archive) appear to be of a similar phase, which Mellaart reported on as a site wide conflagration.

The current team is still divided between intentional versus accidental burning of buildings but there now indications that some, if not all were controlled fires (Harrison this report). Could we be witnessing a new fashion of building closure by fire, one that was introduced but short lived?(the debate rages on!)

With the introduction of our new phasing system we should be able to address whether the fires are roughly contemporary. We will also be able to illustrate and support what so many teams have hinted at over the years, that new trends are adopted mid occupation phase at Neolithic Çatalhöyük.

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4040 Area 2008 – Shahina Farid

The permanent shelter over the 4040 Area was completed just before the season so our work in 2008 combined completing excavations of buildings from previous seasons; targeting areas for stratigraphic relationships and preparing the area for public display (see Figures 6 & 7).

As such the whole of the southern area of the shelter, which had been excavated and backfilled each season since 2004 was cleaned, conserved and prepared for presentation.

In addition, Building 49, a small but complex structure that lay in this area of buildings was completed of its occupation sequence down to the infill of the earlier building. Further targeted excavations took place in a neighbouring Building, 52 to clarify its stratigraphic sequence. The bucrania and associated bench embellished with a row of horn cores in this building, which had been conserved and boxed in 2005 was re opened and prepared for display. To the south and west of B.52 the area of middens were also investigated for stratigraphic relations to associated buildings.

To the centre west of the shelter Building 77 was targeted for excavation. From the surface scrape it was clearly heavily burnt. This proved to be an impressively burnt building furnished with elaborate features including platforms one of which housed horned pillars.

Building 5, which had been on display in its own shelter since 1999 but which is now incorporated into the new shelter and therefore buried last season was reopened, conserved and placed on display.

Visitor access was planned with the construction of wooden walkways and information panels prepared and erected.

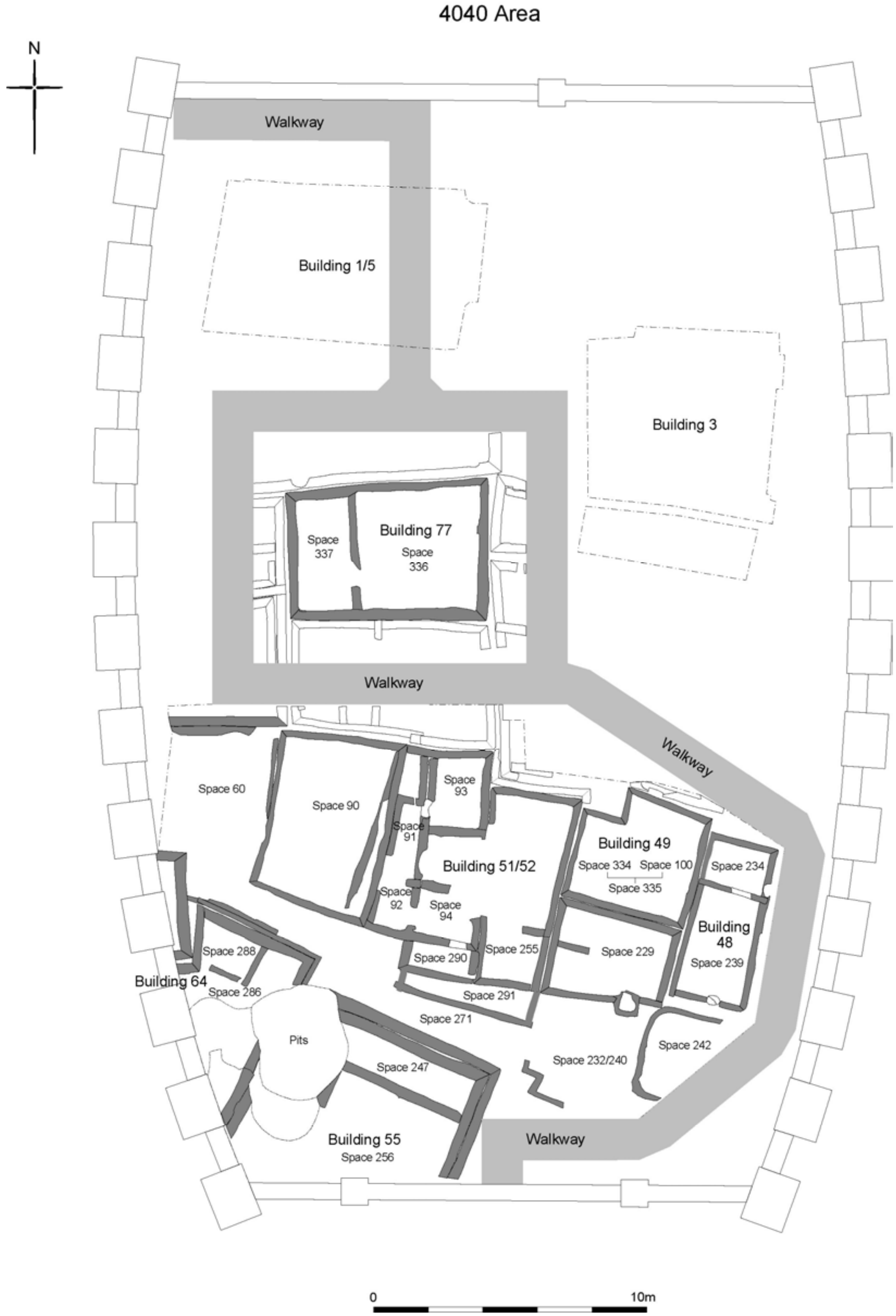

Figure 14: Structures excavated in the 4040 Area and showing public viewing route.

Building 49 Archive Report 2008 - Daniel Eddisford

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Assistants: Louise Felding *, James Taylor*, Freya Sadarangani*, Shahina Farid*, Cordelia Hall*, David Mackie* Colleen Morgan (1), Yasemin Özarslan (2),

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Introduction
The excavation of Building 49 was started in 2004 and continued in the 2006 season. During the 2008 season the building was completely excavated in order to understand the occupational sequence within the structure. Despite its diminutive size Building 49 contained a complex stratigraphic sequence, and represents an architecturally and decoratively elaborate house. The depth of deposits within the building, with evidence of numerous architectural alterations and additions suggests that the house was occupied for a considerable period of time. In its earliest phases of use Building 49 consisted of a single room, Space 335. Later in the building's history it was divided in two by a mudbrick and plaster partition wall. This created a small storage area, Space 334, and a larger central occupation area, Space 100. Despite constant alteration of the building there is also great continuity, with most major features used throughout the occupation. Another example of this continuity is the reuse of material from earlier construction phases when altering features within the building.

Figure 15: Building 49, mid phase, facing N.

Excavation revealed a typical pattern of dirtier floors in the south of the building, associated with hearths and ovens, and cleaner white floors in the north. The central floors of the building appear to represent more mixed use with both clean and dirty surfaces. The patchy, worn nature of the floors across the centre of the building indicates regular use. Several areas of painted plaster were present in Building 49, including geometric wall paintings with red and black paint, walls and features painted solid red, as well as more figurative decoration on the face of the northwest platform.

Fifteen burials were excavated from Building 49, 14 of which were from the northern two platforms excavated during the 2008 season and a headed torso of an older individual (F.1492 (13609)) from the central area of the building excavated in 2006. The North-East platform (F.1664) was used for the interment of five children ranging in age from a newborn to a child of 11-13 years. None of the children had been disturbed. The North-West platform (F.1651) was used to bury nine individuals, including both children and adults. The majority of these skeletons were disturbed, including six which were headless. It is in this northern area that the majority of the painted decoration was concentrated, and this may be in some way associated with the burial process. All of the burials were tightly flexed and several of the burials included grave goods. As with most of the houses excavated at the site, most of the surfaces inside Building 49 appear to have been kept very clean during its use, and as a result few finds are recovered from stratified occupation deposits.

Most of the remaining archaeological deposits associated with Building 49 were excavated during the 2008 season, however due to time constraints the walls of the structure what not removed. Beneath Building 49 infillcomprised crushed mudbrick of a distinct darkish grey colour with orange mortar fragments (17913) which clearly derived from the razing of the earlier walls which were revealed. Building 49 appeared to follow the footprint of the earlier building; however the walls were slightly offset. The architectural features within Building 49 are described below; however a detailed phasing of the life history of the building has yet to be completed.

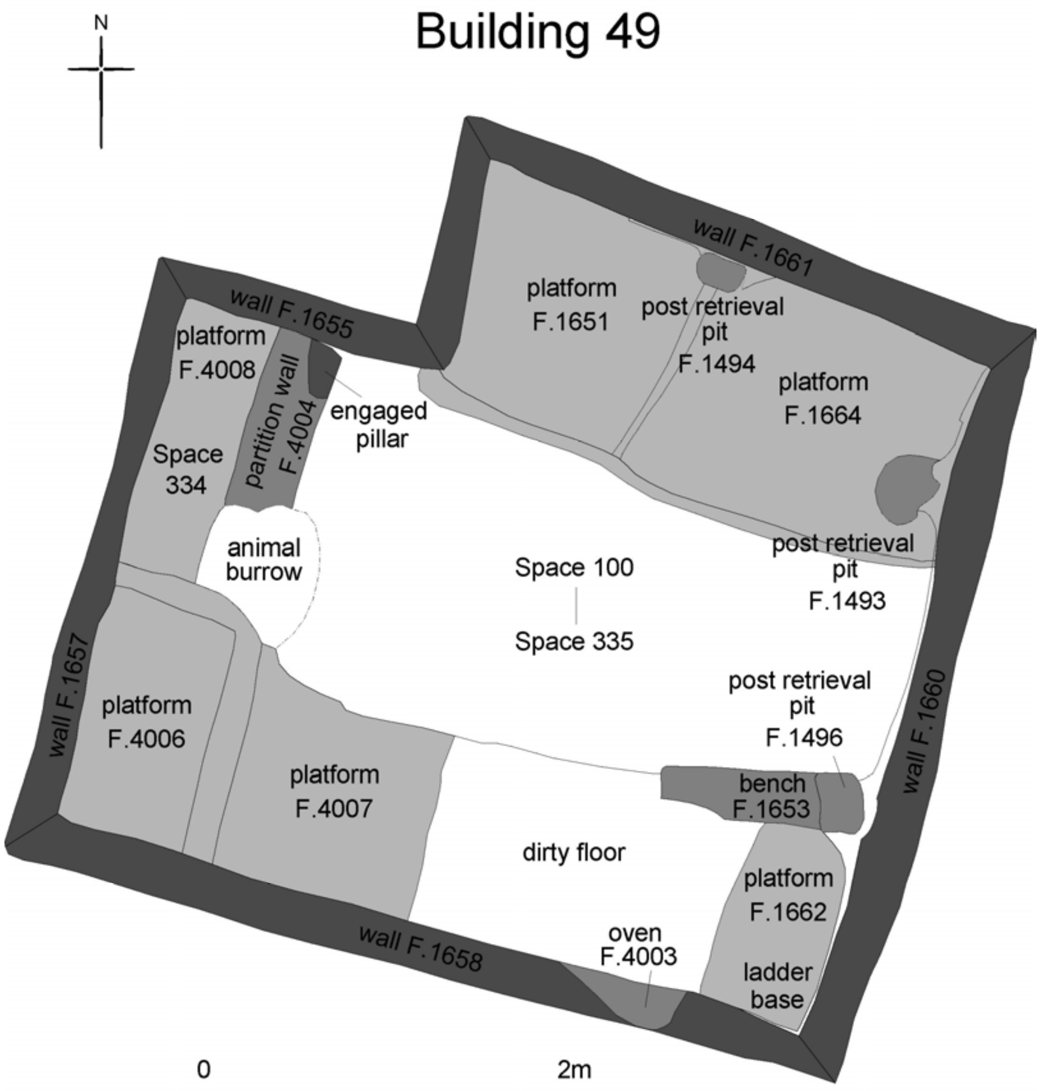

Figure 16: Plan of main features in Building 49.

Northwest Platform (F.1651)

The northwest platform (F.1651) existed throughout the entire life of the building. The platform consisted of numerous layers, representing replastering and remodelling of the feature. Within this sequence of plaster and make-up deposits a series of inter-cutting burials were recorded.

Figure 17: Infant (17457) in F.4023.

The earliest deposit consisted of a layer of mid grey sandy silt make-up (17495), which spread over the northern area of the building, providing a level base for platforms F.1651 and F.1664. This layer was truncated by a well-defined sub-circular grave cut (17458). The burial, (F.4023), contained the crouched skeleton of an infant (17457) (Figure 17) which was lying on a layer of matting preserved in the form of phytoliths. The burial had a number of associated grave goods, including a bone or shell necklace (14457.X1), a beaded anklet (14457.X2), a bone spatula (14457.X8), and a cluster of red painted shells (14457.X4, X5, X6), which would have covered the body. In addition a small fragment of textile (14457.X10) was preserved against a copper bead (14457.X3) associated with the burial (see Woven and Twisted Fibres, this report). The burial was filled by mid brown sandy silt (17456), and showed evidence of having been disturbed by animals.

The burial was sealed by mid grey sandy silt make-up (17495) and grey white plaster (17482), which spread over platforms F.1651 and F.1664 as well as the central floor area. Traces of red paint on the northwest platform F.1651 indicate it was at least partially painted at this point. Wall plaster with red paint on the east (17489) and north (17494), (17497) wall was contemporary with (17482); suggesting a significant proportion of the building was painted red at this time.

A curb (17493), measuring 0.10m wide and 40mm high, was constructed of red brown sandy silt. The curb was oriented north-south and separated the two northern platforms. A series of surfaces were then added to F.1651, plaster floor and make-up (17492), plaster floor (17491) and make-up (17487). This final deposit was truncated by grave cut (17413). The burial, F.4021, contained skeleton (16697), which was in a flexed position but missing the skull and most of the cervical vertebrae; these may have been disturbed by later grave cuts. The grave was filled by mid brown clay silt (14459).

Several deposits survived only along the southern side of platform F.1651. These consisted of white plaster (17477), pale orange brown sandy silt make-up (17476) and white plaster (17475). Both this final plaster surface and burial F.4021 were truncated by burial F.4024. This consisted of grave cut (17486), which contained the tightly flexed skeleton of an adult (17485). Yellow ochre recovered from near the left shoulder and a shell found near the skeleton, were probably associated with this interment. The grave was filled by grey brown sandy silt (17480).

Plaster layer (17475) was also truncated by burial F.4022. Sub-circular grave cut (17414) contained the flexed skeleton of a child (16698). While the skeleton was again missing the skull, the first and second vertebrae were present suggesting the body was fully decomposed before the head was removed. The grave was filled by mid orange brown clay silt (17415).

Burials F.4022 and F.4024 were sealed by a layer of white plaster and patchy make-up (17418); this layer being the same as (16654), (16694) and (16695). This was truncated by burial F.4019. Grave cut (17404) contained the torso (17412) and feet bones (17403) of at least two individuals, and had been heavily disturbed by later intrusions. The grave was filled with friable orange brown clay (16699) and (17410).

Platform F.1651 was considerably extended at this point; a curb (16692) measuring 0.19m high and 0.10m wide was constructed around the southern and eastern edges of the platform. The centre of the platform was then filled with friable mid brown crushed mudbrick (16693). The south facing vertical edge of the platform was finished with a thin layer of white plaster (16666). This layer was red with a row of five white hand print motifs applied in a stencil style (Figure 18).

Figure 18: 'stenciled' hand motif (16666) on side of platform F.1651

This was sealed on top of the platform by a dump of decorated plaster fragments (16690). This material was not in-situ and had been re-deposited on top of the platform to act as a make-up layer. The fragments of plaster were decorated with black and red geometric patterns identical to some of the painted wall plaster in Building 49 (see Figure 4). This unit was sealed by two alternating layers of mid brown make up and white plaster (16682) and 16680. A small circular cut (16668) in the centre of the southern face of platform measured 0.16m in diameter and was filled by light brown clay (16667). This may represent a post hole for an installation associated with the platform. This was sealed by a series of white plaster layers, with black painted decoration on the south facing edge of the platform. The first (16657) was decorated with vertical lines; the second (16647) was decorated with a complex design that may have incorporated figurative motifs.

Figure 19: Close up of abstract motif (16647) on side of platform F.1651

This decoration was sealed by a layer of white plaster (16651). The top of the platform was truncated by burial F.4009. Grave cut (14481) contained the loosely flexed pelvis and legs of a child (14438), the rest of the skeleton having been truncated by later burials. The burial was filled by mid brown silty clay (14480). The burial was sealed by two white plaster floors, both with associated make-up layers (14463).

The latest white floor was cut by burial F.4000; which was the latest burial associated with the northwest platform. Grave cut (14437) contained a flexed female adult (14441) with a necklace of small black beads (14441.X3) and at least one larger barrel shaped bead (14441.X2). The ribs of an infant (14440) and a small green stone axe (14441.X1) on the northern side of the burial appear to represent the remains of an earlier interment disturbed by this feature. The burial was filled by loose mid brown silty clay (14429). The burial was sealed by white plaster and brown make-up (14424), representing the latest deposits excavated from F.1651 this season.

Northeast Platform (F.1664)
The northeast platform (F.1664) was also in use throughout the occupation of the building. A number of burials, mainly juveniles, were recorded under this feature. However the sequence of deposition on F.1664 indicates it had a separate life history to F.1651 directly to the west; both platforms being replastered and altered at different times.

The earliest plaster surface associated with platform F.1664 (17402) was truncated by burial F.4015. A sub-circular grave cut (16661) contained the flexed skeleton of a child (16660). The grave was filled by mid brown silty clay (16659). The burial was sealed by a layer of white plaster (16636). This was truncated by burial F.4014, consisting of grave cut (16642), the crouched interment of a child (16641) and mid brown fill (16640).

This second child burial was sealed by a series of surfaces; a layer of firm orange brown silty clay (16634), white plaster (16635) and (16633), mid grey brown silty clay (16632), plaster and make-up (16631) and grey silty clay (16630). The latest of these was cut by burial F.4012. Within (16628) the remains of a baby burial (16627) showed some signs of animal disturbance. The grave was filled by mid brown silty clay (16624) and sealed by mixed brown silty clay (16621). This was in turn sealed by layer of white plaster (16619) and (16620); the latter was the same as plaster (16622) on the southern wall F.1661.

The latest burial associated with platform F.1664 consisted of grave cut (16602), and contained the flexed skeleton of a juvenile (16601). The mid brown silty clay fill of the grave (16600) contained a single green bead. The grave was sealed by layers of white plaster (14490) and (14488), a small area of red brown silty clay (14487) and patchy grey make-up (14483). The poor preservation of these final deposits is probably a result of their exposure during the backfilling and re-excavation of the building.

Painted Wall Plaster
A number of features and walls within Building 49 were decorated at different phases of the structure’s use. The northern wall F.1661 was decorated with elaborate black and red geometric designs (see Figure 4). These were excavated and recorded during the 2006 season; in addition some of the paintings were lifted and conserved. An engaged pillar F.4004, located on the northwest wall F.1655, also had a sequence of painted decoration. In an early phase the pillar and at last part of the adjoining wall were painted red (16663). A second phase of painted decoration (16649) consisted of a red circle motif. This was sealed by a layer of white plaster (16605), decorated with red and black geometric designs. This was sealed by white plaster (16608) and another layer of plaster (16607), decorated with red and black paint. This was sealed by a final layer of white plaster (16606).

Central Floors
The central area of the building clearly experienced the heaviest use, and the surfaces here were often patchy and hard to define. Generally the floors here consisted of a mixture of white plaster and dirtier, ashy floors. Some of the floors continued on to Platforms F.1651 and F.1664 to the north of F 4007 to the south. The floors slumped slightly at their eastern extent, where they met wall F.1660; this slumping was clearly occurring while the building was in use and repeated attempts were made to level this area. The central floor area contained a great number of floors and it was not always possible to remove these individually, however micromorphology samples were taken in order to better understand the depositional

processes and activities occurring in the building. Almost all the floors in the central area of the building were devoid of finds.

Throughout the sequence of floor deposits there is a clear division between the central floors and the area to the south. A small curb (17478), constructed of pale grey brown silty clay, separated the central floors from dirtier floors to the south. White plaster floor and make-up (17471) was sealed by unit (16646), consisting of at least 11 alternating grey make up and white plaster floors. This was sealed by a further six alternating grey make up and white plaster floors, (16618). The southern extent of the central floor area was the cut back, (16617), and the floors in this area scoured out, possibly to create more space around fire installation F.1665. The floor sequence continued with six layers of alternating dark grey make up and white plaster (14493) and (16615). These were sealed by white plaster floors (14492) and (14461). This final unit sealed F.4002, which consisted of a sub circular cut (14456), measuring 0.35m by 0.20m and 50mm deep. This was filled by soft dark orange burnt clay (14455); the function of this feature was unclear. The scoop was sealed by a light brown make up layer and three plaster floors (14449), light grey brown silty clay make-up layer (14447) and white plaster floor and mid brown make up layer (14426)

Western Area

The western area of Building 49 was delineated by a half partition wall with an engaged pillar, F.4004, at its northern end. This division appears to represent a division of activity areas, and may have been originally associated with a more substantial division constructed of perishable materials. The western area of the building was poorly preserved, compared to the other areas of the building after being badly disturbed by animals.

In the north western corner of the building, set into platform F.4008, plaster basin F.4010 consisted of several phases of use. The earliest basin, (16645), measured 0.45m by 0.40m and had an sub-rectangular grinding stone set in thin layer of mid brown silty clay' (16673)' on its the southern side. This was sealed a second basin constructed of grey brown sandy silt (16644) and plaster (16643). This was in turn sealed by brown clay silt (14485), possibly associated with a later, truncated phase of use. A series of dirty, ash rich, floors (16670) to the south of F.4010 appear to be associated with the activities conducted in this part of the building. Basin F.4010 was sealed by a mixed dump of mudbrick and building material (14482), intended to raise the level of the platform. This was sealed by the truncated remains of a mid brown clay surface (14475), which represents the latest surviving phase of platform F.4008.

Figure 20: Excavating deposit (14460) of platform F.4008.

Platform F.4008 was divided from the southwest corner of the building by a small raised curb (16665), constructed of friable mid brown silty clay. In the southwest corner platform F.4006 was constructed of a primary dump of re-deposited burnt material (14471), possibly from a dismantled fire instillation. This deposit contained a piece of broken antler (14471.X1). This deposit was sealed by a 0.1m thick dump of dark grey loose ashy silt (14460), which formed the core of the platform. This deposit was the same as unit (7957), excavated during the 2004 season, from which a number of animal figurines were recovered. Unit (14460) contained a range of artefacts, including a variety of animal bone, worked and unworked stone, worked bone points, obsidian blades and blanks, and a broken antler tool. All the artefacts seemed to have been used. This assemblage appears to represent the deliberate collection of a number of artefacts from the house, which were then dumped in the southwest corner and sealed platform F.4006. The surfaces associated with platform F.4006 were almost entirely truncated, surviving only as small patches of clay and plaster floors (14462) at the northern extent of the feature.

Figure 21: Detail of binding around antler tool found within (14471)

At this point Space 335 was divided into two different spaces with the construction of a more substantial division. This created a small western side room, Space 334, and a larger central room, Space 100. The division was poorly preserved and consisted of orange brown sandy silt mudbrick (14444) and dark grey ashy silt mortar (14445). The east facing side of the division was plastered with white clay plaster (14443).

Southern Area (Platform F.4007 and Dirty Floors)
The southern area of Building 49 contained two fire installations, F.1665 and F.4003 (see below), and south central platform F.4007. A slightly sunken area between fire installation F.1655 and platform F.1662 contained a number of dirty; ashy floor deposits associated with cooking and rake out activities. These activities continued onto the southern platform F.4007, where a number of plaster basins suggest food preparation may have been occurring.

Directly to the north of fire installation F.4003, a series of dirty floors were recorded. Dark grey silty ash (17470) was sealed by a similar dark red grey silty ash rake out deposit (17469). Mid orange clay silt make up (17446) represents a deliberately laid surface, and was sealed by dark grey silty ash (17443). This was sealed by several white plaster surfaces and red brown make-up layers (17442), (17449) and (17444). A small sub-circular cut (17440) measured 0.40m by 0.54m and was filled by grey brown sandy silt (17439). This feature may have been an ephemeral basin, its location and the fact a clay ball (17439.X1) was recovered from its fill suggests it may have been used in cooking or food preparation. This feature was sealed by dark grey ashy dirty floors (17425), (17438) and a layer of grey brown sandy silt make up (17421).

A circular cut (17432), measuring 0.30m in diameter, truncated platform F.4007 and was lined with a plaster surface and make up (17429) to form a basin. To the west a larger basin was constructed within sub-rectangular cut (17436), which measured 0.72m by 0.56m and 0.22 deep. The basin contained a layer of mid grey clay silt make-up (17435) and at least six layers of grey white plaster (17434). A grinding stone was set into the western side of the feature, and further re-plastering events consisted of grey white plaster (17433) and light grey plaster (17431). The basin was filled by light brown silty sand (17430) after it had fallen out of use.

Platform F.4007 contained a large number of surfaces, partly as a result of its heavy use and partly as the cooking and preparation activities in this part of the building resulted in the frequent deposition of ashy material. Firm mid brown silty clay levelling layer (17426) was sealed by a truncated area of plaster (17416). This was sealed by a single degraded sandy mudbrick (17411), laid along the north side of platform. This is typical of the continuous effort that was made to physically divide activities conducted on platform F.4007 from the central area of the building. A mid brown surface (17409) was truncated by sub-circular cut (17407), measuring 0.26m by 0.24m and 0.10m deep. This was filled by homogenous grey ashy silt (17406), which contained obsidian flakes and animal bone. The function of the feature was unclear, however it may represent a robbed out cache.

A truncated patch of surfaces at west side of platform (16648) indicate that many of the deposits associated with platform F4007 were removed by later activity. Mid brown silty clay surface (17400) was sealed by six surfaces (16696), consisting of make-up deposits, white plaster surfaces and dirty floors. These were sealed by further dark grey dirty floors (16691), (16686) and (16664). These were truncated by another small pit, F.4018, possibly a second robbed out cache. Sub circular pit cut (16688) measured 0.25m by 0.30m and 0.10m deep. The feature was filled by loose mid brown silty clay (16687), which contained a single small stone with polished sides (16687.X1).

This feature was sealed by patchy mid brown silty clay surface (16604) and light brown silty clay layer (16603). Platform F.4007 continues to be used heavily, with a series of deposits accumulating, plaster surface (14497) was sealed by mid grey ashy deposit (14496), light grey brown make-up (14495), mixed friable layer of purple brown re-deposited burnt clay silt (14491). A curb constructed of firm mid brown silty clay (14489) along the west side of platform was overlain by firm brown silty clay make-up (14479). This deposit was truncated by (14494), the cut for later bin.

The latest sequence of deposits excavated from platform F.4007 this season consisted of dark grey ashy dirty floor surfaces (14474), (14472), (14469), (14468) and (14467). Cleaner plaster and make up layers (14439) and (14478) were also recorded. This sequence was sealed by mid orange brown surface (14464), a series of thin surfaces (14423) and patchy mid grey brown surface (14457).

Fire Installation (F.1665)
Fire installation F.1665 was constructed in the earliest phase of the Building 49, cutting into the fill of the building below. This rectangular feature was rebuilt a number of times, and may have been a hearth. Three circular postholes (17462), (17463) and (17464) measured 0.10m in diameter and were located at the corners of the feature. The posts would probably have leaned in slightly, forming the superstructure of the feature. It is also possible the posts were associated with some form of chimney. There was no post identified at the south east corner of the feature, however this is likely to have been truncated by a later intrusion. The earliest phase of F.1665 was within square construction cut (17468), measuring 0.58m by 0.60m. Burnt dark purple brown sandy clay (17467) represents the base of the feature and was sealed by loose dark grey ashy silt (17466).

A second phase of the hearth is associated with a second rectangular foundation cut (17465), which truncated much of the earlier oven. The posts of the original structure were probably removed at this point and the postholes filled by firm light brown silty clay (17460), which formed the base of the new fire instillation. This was sealed by dark grey sandy ash (17459). Friable dark brown sandy clay (17454) represented another oven base, and was sealed by light grey brown sandy silt ashy rake out (17455).

A third phase of the hearth was associated with oval cut (17453), which measured 0.60m by 0.52m. The base of this oven consisted of friable dark orange grey sandy clay (17451), sealed by loose mid grey sandy ash (17450). A fourth phase of the feature was within a 0.78m by 0.66m oval cut (17437), filled by dark red brown silty ash (17422). A fourth phase of the hearth was represented by the remains of a rectangular superstructure constructed of red brown silty clay (14499) with a dark grey brown silty clay base (14470).

Fire Installation (F.4003)
Fire installation F.4003 was poorly preserved, as it was demolished entirely in the later phases of the building occupation. The circular feature, measuring up to 0.80m in diameter and recessed into the southern wall, would probably have been an oven. The base of the feature consisted of a layer grey brown clay silt (17448). This was sealed by a layer of red brown clay silt (17441), representing a dump of make-up material, or possibly oven collapse. This was in turn sealed by a grey brown ashy sand oven base (17447) and black grey ashy clay silt (17423). A series of red brown to black layers of ashy silt (16696) and (17408) represent rake out from the oven. These were sealed by a series of surfaces, (16614) and (16613), and dirty floors, (16612) and (14498), located directly to the north of F.4003. The base of the oven was replaced a number of times, and consisted of burnt friable dark orange silty clay (16681) and burnt dark grey brown clay (16679) and (16675). The superstructure of the oven was poorly preserved, patches of it survived as grey brown silty clay (16676). Burnt dark grey brown surface (16611) probably represents another base of the oven, associated with light brown silty clay construction (16610). Dark grey ashy clay dirty floor (16609),

located within the recessed niche in the southern wall, may represent the final use of the oven. The oven was then dismantled and the niche partially blocked with light grey brown silty clay (14486). This was then plastered with white clay (14458) and incorporated in later re-plastering of the southern wall (14484), (14453).

Southeast Platform (F.1662) and Bench (F.1653)
A small platform F.1662, in the southeast corner of the building, was probably associated with the base of a ladder, and would have acted as an access point into the building. The platform was constructed after the initial plastering of the building. The initial make-up for the platform consisted of mid brown sandy silt (17490). The first plaster phase of the feature (17489) was painted red, along with the entire eastern wall. This was cut by F.4026, which consisted of a small oval cut (17484) measuring 0.44m by 0.34m and 0.12m deep. This was filled by mid brown sandy silt (17483), which contained a single rib bone. The function of this feature was unclear; however it may have originally been a cache of artefacts that were later removed. The fill of F.4026 was sealed by white plaster and associated orange brown make-up (17479). The northern end of platform F.1662 was raised slightly, forming a small bench, F.1653, which was plastered with (17481). Both platform and bench were sealed by mid brown make up (17474) and repeatedly re-plastered with white clay plaster (17473), (17472), (17424), (17405) and (17401). This constant re-plastering of F.1662 and F.1653 continues throughout the buildings use, and is part probably a result of people constantly coming in and out of the building over this feature. A layer of ashy clay and plaster (16684) appears to have been a repair to platform F.1662, and was sealed by white plaster (16683). Mid brown clay (16685) appeared to be a trample deposit and was sealed by mid brown make-up (16656) and white plaster (16653), which had traces of red paint on it. This was sealed by white plaster (14433), mid orange brown (14430), dark brown silty clay (14428) and white plaster (14422).

Building 77 – Michael House, Lisa Yeomans

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Introduction
Building 77 was targeted for excavation this season due to the nature of its termination by fire, which was either deliberate as a ritual termination or accidental. This burning event has given us insight into construction techniques as well as an estimation of the original height (3.20m) of the structure. Our aim this season was to excavate the house of its infill to reveal the last phase of the building.

The building was at first confusing with two of the exterior walls showing no sign of burning and having no plaster. However our excavations soon established that the entire northern and western walls and elements of the southern and eastern walls were in fact the foundation courses of a remnant later building following almost the exact footprint of our burnt Building 77. These later walls formed Space 83 within which crouched burial F.3083 was most likely associated.

Removal of the upper fills of the building revealed an internal dividing wall forming Space 337, the smaller (4.10m x 2.00m) storage area to the west, and Space 336, the large (4.40m x 4.40m) living space to the east. The fills, despite containing interesting structural evidence were relatively sterile of material culture, but contained many large bones from both cattle and equid, including several horn cores and carbonised structural elements affording the collection of several good dendrochronological and C14 samples.

The building revealed a number of exciting features preserved by the fire. In Space 336 these include a ladder scar on the southern wall (SE corner); two engaged, plaster decorated pillars on the eastern wall, and what appears to be a burnt off roof beam emplacement. On the northern wall towards the NE corner is a small plastered rams head, which originally held protruding horns, below this is a small niche. Also, roughly central on the northern wall is a large alcove, and a second niche mirroring the first on the western side of the alcove. To the west of this is a large plaster covered feature built around three large structural timbers with a wattle frame. It incorporates a crawl hole to allow access from the north central platform and was most likely for storage although its true purpose is uncertain. The exterior was thickly plastered like the walls of the space and had some form of decorative moulding, perhaps a plastered niche.

Six platforms and a bench were located against all four walls forming a central sunken floor area. The northeast platform F.6051 is particularly noteworthy for its two low pedestalls with protruding horncores creating an enclosure around the platform.

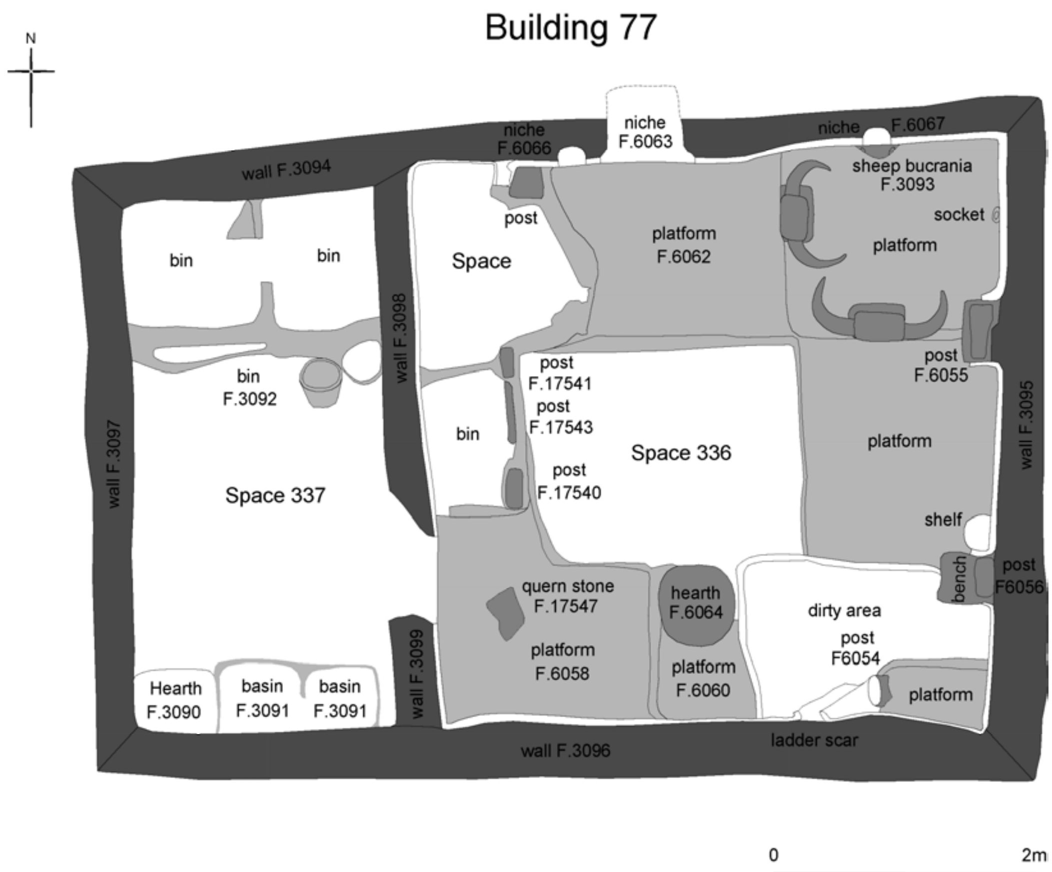

Figure 22: Plan of Building 77

The floors were covered in cultural debris possibly representing abandonment deposits, which include a large quantity of burnt animal bone, horn and red deer antler, several clusters of grind stone, a number of small polished stone axe heads, several tools and worked bone objects, and phytolith impressions of either some spiral matting or basketry. In the SE corner around the ladder was a deposit containing burnt seed grain and peas, which were most likely held within a container. From the scatter pattern it seems probable that many of the objects had either hung from the rafters of the roof or fell in from the roof during the early collapse by burning.

To the north of Space 337 the 'store room', were two large bins. These appear to have been deliberately backfilled and devoid of any primary material. The floors to the south of the space revealed the outline of several basins and a small hearth against the southern wall where scatters of several clusters of grindstones (possible bone working tools) were found including an articulated eagle sized bird talon and obsidian projectile point. Also covering the floor in front of the bins was a thin layer of charred seed grain.

Figure 23: Building 77 excavated. Looking N.

Platforms, benches & basins

The platforms within the space define the form and function of the area. Located against all four walls the series of stepped platforms create a sunken a central area 2.10m EW x 1.60m NS. A further lower sunken area lay in the SE which was most likely the entrance to the building.

The platforms are described and discussed moving around the space in a clockwise direction from the NE corner.

Figure 24: NE platform F.6051. Horned pedestals in a seemingly protective or embracing configuration around the platform with moulded plaster ram head facing in.

One of the most striking features within Building 77 is the NE platform F.6051 measuring 1.55m x 1.50m x 0.42m this square platform is adorned with two pedestals located centrally on the southern and western edges of the platform (southern 0.37m x 0.20m x 0.21m & western 0.32m x 0.18m x 0.28m, the heights measured from the top of the platform). From each pedestal protruded a pair of cattle horn cores in remarkable preservation considering the fire and subsequent infilling. The variation of deposits above this platform in the NE corner may indicate a more careful infill process.

It is unclear as to whether the horns were inserted with sheaths. A slight gap between the horn core and pedestal structure may indicate the decay of the sheath but this is uncertain, however if present the horns would have been up to a third as long greatly reducing the available space on the platform, and begging the question as to the function and use of this platform space.

On the surface of the platform was a group of three grindstones and a hammer stone (17512). It is unclear whether these were deliberately placed or fell in from the roof from a second story. Beneath the stones there was little or no burnt material so they had either fallen in early on in the burning or were there already. The carbonised remains of two basket bases or matting (17528) were also found on the surface of the platform.

The centre of the platform has suffered some subsidence suggesting the location of burials. There also appears to be some disturbance in the NE corner and some evidence of localised repair. This prominent feature in the building seems to demarcate some form of sacred space for ritual function and works in conjunction with several other features in the NE corner.

To the south of this elaborate platform located against the eastern wall is a large comparatively unremarkable platform F.6052, 1.75m x 1.38m x 0.17m. On the surface was a small cluster (16490) of a burnt scapula and a polished stone axe. The platform drops onto the central floor area at a height of 0.10m and on to the SE floors at a height of 0.17m.

This platform as with the NE platform clearly abuts the engaged pillars against the eastern wall and as a result the southern pillar F.6056 creates a flare up point for a second seat of fire resulting in variable preservation of the plaster on the platform. The upper surface has a remnant of white marl plaster on a partially fired orange clay make up layer. A V- shaped burn pattern is visible on both the platform surface and the eastern wall as a result of the intense heat produced during the burning of the wooden core of the engaged pillar, which causes the removal of any soot from the walls. Currently the platform plaster surface is in a fragile state due to the fire damage, burial and subsequent excavation such that it will require much future conservation if it remains on display.

Figure 25: Ladder scar F.6054 in SE sunken corner with post scar on E wall

In the far SE corner is a small platform or step F.6053. it is located directly beneath the ladder scar F.6054. The small platform was either constructed around the base of the ladder or cut for its insertion. It may be that both of these processes have occurred as the surface at the base of the ladder clearly shows evidence of repair and may well relate to the ladder being replaced or repaired at some point during the buildings life. The plaster on the surface is brown and powdery, finely laminated and covered in soot. Unlike the white marl floors to the north this most likely represents a sequence of dirty floors around the entrance/exit to the building. The abandonment deposits in this area were of particular interest, comprising of a sequence of layers containing carbonised timbers and plant remains and seeds, as well as a number of x-finds and two distinct clusters of objects. The first in the sequence was (17519) a layer of ashy silts and charcoal, containing a concentration of burnt seeds and peas, animal bone including a worked bone pin and a small polished stone hand axe. Above this was a layer of blackish brown clay (17513), containing large charcoal lumps and brunt brick and plaster fragments, a small polished green stone hand axe another bone pin and worked bone object (pin head?).

In the very SE corner, east of the ladder was (16491) a cluster comprising of mainly stone objects; three polished stone axes a hammer stone and worked stone object an animal scapula and two other stones (un-worked).

Figure 26: Revealing primary debris across the floor of Building 77

To the west of the ladder base in the space between F.6053 and platform F.6060 was a cluster of animal bone and worked stone (17501) including a hand axe; hammer stone, dog skull, cattle jaw, horn core and scapula, as well as two other un-worked stones. These two clusters were sealed by a second layer also containing concentrations of burnt seeds and peas, charcoal and stone (16498). This sequence of deposits most likely relates to some form of burnt container(s) in the SE corner and its/their contents.

A small platform F.6060 (1.20m x 0.80m x 0.12m) located centrally against the southern wall appears also to have once been the location of the buildings oven, something visibly lacking at the buildings abandonment. This supposition is based on the arched scar on the southern wall F.3096, which was later plastered over. As with several other features in the building this platform was the location for a discrete collection of stone (17510) 26 pieces in all. The type of stone for all except three was the same and all were fire cracked during the burning of the structure. The 23 stone fragments most likely relate to one or more larger stone object(s) destroyed in the intense heat at the seat of the fire. The other stones included a polishing stone and two other fragments with a different morphology from the rest of the cluster, rounded but unworked. The cluster included several fragments of unidentified burnt bone.

The small platform has been cut into by a sub squared, shallow basin F.6064,. This could have functioned for food preparation but it could also be a hearth but which is difficult to define without further excavation as the overall fire damage makes it difficult to distinguish. Based on other house plans it is more likely to be a hearth, which were commonly located near the southern wall. It could also have replaced the earlier oven.

In the SW corner is a large L- shaped platform F.6058 (1.76m EW x 1.7m NS x 0.1m. This platform is located in the area understood to be the through space to the storage area to the west Sp.337. A grind stone (17547) was set into the platform at its centre, this may well indicate the platforms function as a food preparation area and also adds credibility to the location of it as a through space to the storage area. The surface of the platform was heavily burnt and according to Karl Harrison the pyro-technology specialist 'was the most likely area in Building 77 for the seat of the fire or point of combustion'. This was interpreted on the basis of a relatively thick layer of wood ash and timber fragments (17511) in the SW corner. This ash was present throughout the building as a thin interface between the demolition back fill and the abandonment deposits, floors and features. This ash lens was noted throughout and excavated with the overlying layer. It was most substantial here in the NW where we were able to excavate it in isolation. On the surface of the platform below the wood ash and timber fragments was a cluster (17517) of burnt animal bone including a heavily burnt cattle horn core the scapula of a sheep, both sides of a dog mandible and an articulated bird claw of an eagle sized bird of prey. This group of finds correlates with several that were recovered from the southern end of Space 337. The northern end of the platform was also the location of a small collection of burnt grindstone.

A small bench F.6059 (0.63m x 0.4m x 0.23m) was located against the western interior wall. Later in the buildings life the bench was incorporated into a screened feature F.6050. One of its large structural timbers truncated the eastern end of the bench. Being close to the seat of the fire with the large structural timber fuelling combustion the plaster surface is powdery and red with very remnant flecks of the white marl remaining.

The bench forms the southern edge of a basin F.6061, the northern edge being demarked by the large northern platform F.6062. It would appear that this basin/bin developed later in the buildings life with its eastern limit being formed by the plaster screening erected during the construction of F.6050, a large mysterious screened storage area in the NW corner. The function of this feature is unclear. The space was filled with an abandonment deposit of 54 fire-cracked stones (17527), within a matrix of carbonised wood and ash covered with (17525) primary burnt timber collapse.

The final platform in Space 336 F.6062 covers two thirds of the northern width of the space 2.9m x 1.7m – 1.54m x 0.16m. Its form was a slight L, the thicker end to the west formed the northern limit of basin/bin F.6061. The size of the platform was later reduced to 1.8m EW with the construction of F.6050. The platforms surface was in a poor state like that of the NE platform due to a combination of ancient fire damage and modern exposure with the damaged surface drying out and flaking off. However on its southern edge the original white marl could be seen as a remnant on a highly fired red clay make up layer. This same layering could also be seen in the large central area and on platforms F.6052, F.6060, F.6058 and bench F.6059. As with the NE platform this platforms SE portion has suffered subsidence, most likely the due to burial placements.

A large collection of grind stone (17509) was found on the surface of the platform in front of the alcove in the northern wall. This group included 101 small, squared and rounded stone some of which are possibly worked. 8 larger stone fragments, 4 grain grinding stones with flat bases and concave basins, a hammer or rounded grinding stone and one worked stone with a groove for bone working or shaft straightening were part of this assemblage. Like many of the other clusters there was little material below the stone cluster that would suggest it was anything other than an abandonment deposit, although it may well have fallen in from an upper floor early in the burning event. Above this was a second group of red deer antler , cattle bone and tortoise shell (16489).

Storage space, niches and alcoves

In the NW corner of Space 336 was F.6050 a screened storage area, incorporating several pre-existing features. This strange feature was constructed around three large structural timbers with wattle walls between. The space created by these walls was accessed from the north platform F.6062 through a crawl hole. The outside was covered with a succession of white plaster layers 4cm thick, consistent with the plaster thickness on the main walls forming the room/Space 336. The plaster on the north and west walls within the structure was however, very thin, less than 4mm thick, which implies that the appearance of the internal structure may have been less important. The structure itself was established relatively early in the buildings life. Damage to the plaster on outer shell demonstrated that some of the plaster phases were clearly decorated with red paint.

It is difficult to visual what this feature looked like due to its poor state of survival. It stood to a height of at least 1.13m and a width of 1.1m. It had at least one internal partition. Plaster scars and moulding on the N-S internal wall F.3098 and on the northern wall F.3094 may indicate the structure did not stand a great deal higher than as found and may well have terminated at the southern edge of the bench F.6059 giving it a total length of 2.63m.

Figure 27: Storage type feature F.5060 in NW corner of Space 336, constructed around 3 wooden posts with carbonised remains in situ

Cut into the northern wall was a large alcove F.6063. This was initially believed to be a crawl hole through to another room to the north but it but it backed on to the wall of the building lying to the north.

Two niches F.6066 & F.6067 were located to the west and east of the large alcove on the northern wall.

Pilasters, ladder & Decorative features

The ladder F.6054 comprises several components and is the only possible entrance/exit to the building/space (see Figure 25). The platform F.6053 at the base of the ladder forms a step. The wooden structure of the proposed ladder was burnt in situ (17539) with the remains standing to a height of 0.3m. A plaster support structure 0.15m wide bonds the feature to the southern wall, and stands to a height of 1.32m. It appears that the timber has been replaced at least once in the buildings life due to a re-plastered scar just to the east of the burnt timber. The ladder was most likely a single carved timber with foot supports as oppose to conventional ladders. The angle of the ladder is steep at 75 degrees.

Figure 28: Post F.6055 with remains of carbonised post in site. Section through rounded plaster moulding to the top left.

On the eastern wall were two engaged pillars or pilasters both of which hold the charred remains of their timber posts. The northern pillar F.6055 is engaged to the wall by successive plastering events, little or no plaster can be seen behind the timber just the exposed brick work of the eastern wall, so it can be assumed the pillar was an early addition to the internal layout of the house, most likely one of the first. The burning has preserved the actual structural timber (17537), which survives to a height of 0.45m (0.4m x 0.19m) above the floor surface; the plaster survives to a much greater height of 1.2m. The pillar was decorated with a plastered relief with a remnant surviving on the southern face of the pillar. Fragments of the decorated elements were also recovered from the back fill/collapse of the building nearby the pillar. The plaster was 4cm thick on the pillar as on the whole eastern wall.

The southern pillar F.6056 was located closer to the seat of the fire and as such the post (17538) had almost completely burnt out. Towards the top on the north side was a scar for a moulding which was recovered from the fill and formed a rounded protrusion (see Figure 28).

At the base of the pillar was a small curb. The plaster is between 4-5cm thick demonstrating the longevity of the feature, however unlike the northern pillar a thin layer of plaster can be seen on the brickwork behind the post itself. This may represents a plaster undercoat prior to the installation of the features within the space.

The burning of this post may have rekindled the seat of the fire providing a renewed source of fuel and produced a distinctive V shape burn mark on the eastern wall as the intense heat removed all carbon products (see Harrison, this report).

Decorative features on the northern and eastern wall above the NE platform F.6051

F.6057 is a large plaster relief most of which has either been removed or more likely fallen off during demolition or during the fire. (see Figures 23 & 24). The debris is mixed in the demolition back fill of Space 336. It formed a sub oval scar located on the northern wall just above the eastern horned pedestal of platform F.6051. Its original dimensions would have been 0.8m x 0.48m x 0.1m thick. The scar (17530) contained a burnt remnant of a small post (17544) integral to it. This may have supported the weight of an additional plaster moulding or boss type element – possibly even another bucrania? Once again the thickness of the plaster indicates the longevity of the feature.

Figure 29: Moulded plaster ram's head on N wall of Building 77, centrally positioned to platform F.6051 and above a small niche F.6067. The inserted horns were broken off in antiquity.

Just to the east of this was F.3093 a small plastered rams head or bucrania (0.28m x 0.2m projecting 0.12m from the wall). Inset were broken off horns but it is unclear whether this was accidental or deliberate. Examination of the horn material (16493) has identified it as sheep.

Directly below this was a small oval niche F.6067 plastered part way in. The niche measured 0.19m x 0.12m x 0.25m deep and was at a slight angle. The fill (16487) was unremarkable and absent of any cultural material, similar to the demolition back fill at this height of the space.

On the eastern wall above the platform was F.6068 a plastered post (possible beam?) that was burnt and sheared off flush with the wall. The post, 7cm in diameter would have projected out from the wall over the platform at roughly the same height as the small bucrania beside it on the north wall. The post was plastered many times increasing its diameter to 13cm consistent with the thickness of the plaster on the wall. This feature may have supported a protruding decorative feature above the platform.

Space 337 – Lisa Yeomans

Form and layout

Space 337 is the western storage space of Building 77. The route of access between the two spaces is uncertain as a late pit (16471) truncates the dividing wall F.3098 where, if there had been a crawl hole, the point of access would have been located as the middle part of the room is devoid of features. Heights of the walls surrounding the space range from 1.2m - 1.3m. In addition to this preserved height an additional 16 courses of collapsed bricks within the demolition rubble infilling the space indicate the possibility of a second storey or an enclosed roof space at the very least. The internal dimensions of the space measure 4.1m (north-south) x c.2.0m (east-west). Burnt plaster was found on all of the walls except the southern wall although this may have burnt off during the fire.

Against the northern wall is a series of storage bins (F.3092). In the southern end of the space were a hearth (F.3090) and a double basin feature (F.3091) defining an activity area.

Figure 30: Storage bins F.3092 to N of Space 337

The volume of storage provided by the bins in the building is the largest yet exposed at Çatalhöyük with the main part of the bins formed by a clay structure dividing off the northern 1.05m of the space and therefore covers a quarter of the area within the room. The clay dividing structure is only 0.06m in thickness but survived to a height of 0.85m and had a north-south partition forming two roughly square bins (NW bin measures 1.05 m x 1.05m and the NE measures 0.95m x 1.05m in area at the top). The lower part of the bin wall bells out but was damaged during the fire and abandonment of the building so the access into the bins is less certain. On the NW bin, although damaged, there appears to be an opening just above where the bin bells out. On the NE bin a gap on the western part of the front may have formed an opening, as it would have been difficult to gain access to the contents of the bins from the top given their height. A third small, circular bin was built into the main structure of the bins and attached to the western wall of the Space 337. This had been built to a height of 0.33m with a clay base and vertical sides (Figure 30). A provision that was used less frequently, was less common, or was maybe a supply in a prepared state could have been kept in this front bin. In addition to the insitu storage bins, lying above the floor, was an apparently collapsed fragment (17504) from the upper parts of a bin. This had been constructed from the same dark grey clay used in the bins and was a hollow, slightly flattened and tapering tubular shape. The measurements were 0.42m x 0.36m at the wider end, 0.26m x 0.13m at the narrower end with a length of 0.35m and thickness of 22mm. It was either part of a lid to one of the bins that had fallen off during the fire and abandonment or it was possibly part of another bin. Of note was the quantity of charcoal in the fills of the bins just above the floor level and this may have been from burnt timbers used in the upper parts of the bins construction. The bins themselves were probably built late in the stratigraphic sequence of the space before the fire as the sides of the bins abut layers of wall plaster. Although the walls of side rooms are not re-plastered as frequently as the main spaces of the buildings, approximately 0.3-0.5mm of plaster had built up in the room and all of the plaster layers extended behind the construction of the bin. In the bases of the two large segments of the bin the floors had been coated with a white plaster. These layers were not excavated but both ((17515) in the NW bin and (17516) in the NE bin) appeared to be a very thin coating or makeup deposit.

The dark brown silty clay floor (17514) in the central part of Space 337 lipped up against a hearth (F.3090) and a double basin that had been built against the southern wall. The hearth was located in the SW corner of the space and was demarked by a burnt shallow scoop measuring 0.64m x 0.48m x 0.08m (Figure 31). A concentration of charcoal (16485) was excavated in the SW corner was interpreted as the remnants of the final burning although it is also possible that it could be a collapsed structural timber after the fire. Perhaps species analysis of the charcoal may help differentiate the two. To the east of the hearth was an activity area defined by a double basin (F.3091) (Figure 31). This formed a continuous lip in the flooring sequence from the end of the hearth to the eastern wall of the space. The double basin feature was shallow (0.04-0.07m) and appears to have functioned as defined scoops within which activities could take place and cleaned easily.

Evidence of the fire and abandonment
The burning episode, which engulfed the building, originated in Space 336 but there was significant damage and burning to the material within Space 337. The intensity of burning in the southern part of Space 337 suggests that fire spread through in the southern part of the room supporting the presence of crawl-hole between the two spaces that had been truncated by a late pit. At the time of the fire numerous cultural items were left on the floor to be sealed by the collapse of the walls and roofing material. A concentration of these finds was found around the hearth and particularly in the eastern scoop of the double basin perhaps indicating an activity area within the space. These finds were given a cluster number (16483) and comprised of 40 finds. Most of these were unworked stones, a polished stone, a couple of hammerstones and a stone pounder (Figure 31) photo of cluster 16483 in basin). There was also a sheep horncore and the claw of an eagle-sized bird. These finds could be interpreted as a group of raw materials ready to be worked or in various stages of preparation. The location of the finds next to the hearth suggests that they were left in the area where this working would have taken place.

Figure 31: Artefacts strewn across the hearth F.3090 and double basin F.3091 along the S wall of Space 337.

A number of other finds were found on the floor of the space but less concentrated. Another bird talon (16468) from the same species and same-sided claw was found. Additional stones 16478.X5 and X6, an antler 16678.X1 and an obsidian point 16468.X7 were all lying on the floor. These must have been left at the time of the abandonment/fire. In additional to the finds found on the floor were several finds within the fill but not lying on the floor. Given the possibility that there was a second storey, or at least an enclosed working space on the roof, these finds may have fallen into the fill at the time of the fire. They include a couple of grindstone 16478.X2 and X3 and in the more clayey fill (16469) that may derived more from that collapse of features rather than walls, was a worked stone 16469.X1, an obsidian arrowhead 16469.X2 and a figurine 16469.X3. Similar finds were found in the upper fills of the bins and include an alabaster bracelet fragment 16742.X1, worked shell 16742.X2 and a couple of figurines 16742.X3 and X4.

In the central part of Space 337 the floor just to the south of the bins was covered with a thin spread of burnt grain (16480). This spread of grain seems to have been spillage from the bins and covered the third same-sided bird claw found of the same species (16480.X1) (Figure 32) and a grindstone (16480.X2). It is interesting that a large quantity of grain was left on the floor whereas there was not the same quantity in the bins. One possibility is that there could be a preservation difference since the grain on the floor was covered with clay collapse from the bins and blocks of this clay could be lifted with the grain embedded on the underside. Perhaps this clay helped preserve the grain from being completely destroyed by the fire whereas any grain left in the bins may have been exposed to higher temperature burning. Flotation samples were taken on the fills above the bin floors and these may indicate whether there was heavily burnt grain not visible during excavation within the bins. The lower fill of the NW bin (16488) produced a number of X-finds in the fill, a cattle scapula 16488.X1, two stones and two figurines (16488.X5-8) were found higher above the floor. Three finds were lying on the floor, a goat horncore 16488.X2, an antler 16488.X3 and a large flat stone 16488.X3. First impressions suggest that the bin was empty of grain with an area of unburnt wall plaster lying on the floor below a spread of charcoal but analysis of the flotation samples is needed to confirm this. The lower fill (16497) of the NE bin produced a number of large bone fragments (16497.X1-7) including an antler 16497.X7 but none of these were lying directly above the floor. A very clear concentration of charcoal was found directly above the base including one fragment of a timber measuring 490mm x 95mm x 20mm. Again no grain was visible during excavation but a flotation sample taken from just the base of the bin was taken to be certain. Additionally the entire fill (17502) of the small bin attached to the front of the main bins was taken as a flotation sample.


Figure 32: Spread of carbonised grain (16480) with bird claw 16480.X1

Summary

At the time of the fire many finds were left on the floor of the Space 337 indicating that the room was not deliberately cleared out. So far the only exception is the lack of grain in the bins and this disparity may be related to preservation differences given the quantity of grain found on the floor outside the bins.

Infill– Michael House

Figure 33: Burnt debris infill of Building 77. Looking N.

The infill of Building 77 consists of abandonment deposits, clusters of fallen or placed objects, primary structural collapse and demolition backfill in the space prior to building a new structure on the foot print of the old. Some clusters have been discussed above in association with individual features.

At the centre of the room/space in the sunken area created by the surrounding platforms were two clusters (16492) and (17506). The first was a large cluster of primarily red deer antler mixed in with an articulated sheep tail, a cattle scapula and skull cap with the horn cores attached, all was heavily burnt and in poor condition. To the east was a large flat grindstone with a concave grind basin, perfect for grain grinding and just south of this was a spread of four polished stone axe heads (x7-x10), a bone pin and small clay ball. In the NW corner of the central space was another clay ball and a curious figurine X11. Another cluster was a spiral woven phytolith impression of matting or basketry.

It is likely that much of this material derives from collapse of the roof or material kept in hanging containers from the roof rafters.

All though a thin layer of wood ash and charcoal was present through out the space it was often so ephemeral less than 2mm that it was removed with the brick crush/demolition back fill above. However, on top of some of the abandonment deposits and features the concentrations of burnt structural timbers and wood ash were thicker affording more detail recording and excavation. These are (17525) in the NW, (16486) and (16484) in the SE and (17511) in the SW. All these deposits were loose and friable and to a greater or lesser extent contained wood ash charcoal lumps and some larger burnt structural timbers.

Contained within F.6050 the screened storage area in the NW corner was (17525). It consisted primarily of burnt structural timbers including one half split post, some small flat plank like elements, and many thin wattle like timbers, mixed in with some very burnt brick and plaster fragments. Most of this is likely to relate to the primary collapse of the screened off structure. The deposit also contained some red deer antler fragments a cattle jaw and an antler tool (X1) with a clay handle probably used for the pressure flaking of obsidian and flint tools, although no flakes were found in immediate area. In the SE corner the deposits of seeds and peas were sealed by (16486), which was in turn capped with a silty compact layer (16484), still rich in burnt structural timbers. Both of these layers relate to some form of primary collapse of structure in the SE corner either the ceiling and/or the ladder, mixed with what ever the seeds and peas were contained in. (17511) sealed cluster (17517) on the SW platform.

Primary collapse and primary back fill
Sealing (17511) and the clusters in the central area (16492 & 17506) was a concentration of plaster fragments (17500) including some larger curved and moulded decorative fragments; this could be ceiling collapse or primary demolition back fill.

In the NE corner (16495) sealed platform F.6051. This firm to compact layer of slightly clay silt was distinct from the other fill within the space. It is possible the material was deliberately placed to protect the NE platform. The high content of charcoal fragments and burnt structural timbers mixed into the deposit most likely indicates this happened after the burning of the structure but before demolition. The deposit may have been deliberately placed to protect the platform, its horned pedestals and its symbolism. A similar deposit (17524) was found in the NW corner inside the storage structure F.6050 and both have similarities to the material taken out of the storage bins in Space 337.

Demolition and infill
The character and deposition sequence of the infill may suggest the process and order of demolition and subsequent infilling. The larger courser infill lay below more powdery deposits of brick crush that most likely relate to cleaning up at surface level.

All the above deposits and clusters were sealed below (16479)/(16481)/(17522). These three deposits represent the primary demolition in fill of the space. Deposit (16479) covered the bulk of Space 336, (17522) was contained within the NE feature but could be broadly equated to (16479) and (16481) was an arbitrary number allocated as an interface with the floors of (16479). A comprehensive sampling strategy was established. These units contained a great deal of structural material, bricks, plaster and structural timbers (all burnt). There was a large quantity of well preserved bricks through the intensity of the fire and many could be recovered near complete (300mm – 470mm x 190mm x 100mm). The size of the bricks was consistent throughout the deposit. All bricks recovered are mould built, smooth and slightly concave on the upper bed where the clay had settled into the mould whilst a rough uneven base on the underside where the brick was cut. However, it appears that the size of the bricks within the demolition infill are a different width to those in the surviving walls where they measure 300mm instead of 190mm. The demolition material clearly contained plaster structural elements from this building that could be reattached to the walls, so it seams unlikely that the bricks were from a different building. It appears that these smaller bricks must have related to something higher in the construction as it appears that the standing walls were demolished to a height where a change was noticed. At this horizon the plaster began to curve into the space.

This primary demolition material was up to 1.0m thick and contained a mix of burnt and unburnt material of bone fragments, obsidian flakes, chert and flint tools, fresh water muscle shell, the latter probably from brick temper. There was some seeds (hackberry) but very occasional pot fragments (two fragments from 6880lts. Other finds included a cattle horn core, pelvis, tibia and scapula (not from the same animal) and a red deer antler, as well as a number of clay objects including; 3 figurine fragments, 2 clay beads, and a clay seal.

Figure 34: Squat owl/bear-like figurine 16476.X1.

The next sequence of demolition material was pushed in from the north, spreading no further than 2m into the space. The first (16477) was a fine powdery brick crush which also filled the alcove in the north wall. This was sealed by (16476) a section of partially articulated brick and plaster collapse. In the NW corner (17521) was a section of collapse that clearly broke off the corner of F.6050. The large displaced piece of collapse was coated in plaster 4cm thick with a some form of moulding, most likely a shelf or niche on the exterior. Its clay core was 6cm thick and highly fibrous. The interior was finished with a thin skim of grey plaster. The structure F.6050 incorporated an earlier pillar on the north wall and its void was filled with large fragments of burnt brick and a loose matrix of brick crush. Within it was also a hammer stone and a large figurine X1 of an owl or bear like thing, reminiscent of those found in Building 17, South Area (Figure 34). This deposit corresponds with (17522) the fill within the feature F.6050 which also contained an animal figurine (partial head and body) as well as a clay bead and stone ring fragment. The NW corner was then capped with (17520) another layer of loose and burnt structural debris.

The next layer of demolition back fill (16467) also appears to have been deposited from the north covering the entire northern width of the space (4.5m) and spreading 3.2m to the south. This deposit contained far less large brick and plaster fragments consisting primarily of finely crushed brick and demolition dust. This pattern of dumping from the north continues with (16466) in the NE corner above the platform, which contained substantial amounts of burnt structural timber (one taken for dendrochronological dating). This was sealed by (16454), a firm clay silt deposit containing several large ground stones and animal bones, most of which were not heavily burnt, and most likely relate to activities after the burning of the building.

Sealing all these deposits was (16458) another layer of primary demolition containing large sections of loose burnt brick rubble with frequent charcoal lumps (concentrated in the NE corner). The unit included large fragments of plaster collapse that had sheared off the upper part of the eastern and southern wall, as well as structural elements from the engaged pillar F.6055 and an intact specialist brick 300mm x 120mm x 90mm with unknown function. The deposit lacked the usual background cultural deposits, being clean of finds other than structural material. Most of this material is linked to the demolition of the eastern and southern wall, with the greater thickness of deposition being in the south 0.25m.

The next small but important sequence was located approximately at the centre of the space, and consisted of two large sections of structural material and associated deposits. (16448). Here lay a large section of wattle and plaster, most likely formed an internal screening that may have been from a second story. The plaster was white with red paint (pigment sample taken), the whole section measured 1.4m in length x 0.15m thick, the plaster being 1.5 – 2cm thick. Sealing this were three layers of degraded plaster and ash (16432), (16431) & (16425) above which was a large articulated section of wall collapse 1.93m x 0.9m x 0.3m consisting of 16 courses of bricks (16421) and a clay rich mortar with frequent charcoal inclusions (16423) and a thin remnant of plaster (16424). This is most certainly a section pushed in from the western internal dividing wall F.3098 as the thin plaster on what would have been the western face corresponds with the thin plaster in Space 337, whilst the layers of degraded plaster below are more in keeping with the thickness on the east facing wall of Space 336. These plaster layers are slightly thicker, possibly representing some form of decorative relief which is common to western walls at Çatalhöyük. The bricks were also an exact match of silt rich with a low clay content 660mm x 90mm x 320mm. This section added to the upstanding wall provides a total height of 3.2m to this section of wall with no sign of roof or ceiling structure.

This was sealed below another extensive (4.5m x 4.4m x 0.3m) demolition/back fill layer (16408) consisting of large chunks of burnt mud brick and plaster within a finer brick crush. Some of the bricks were near complete and kept for analysis. Some clay fragments had clearly been in contact with a timber support structure, possibly roof material.

The final fills were more mixed containing less large architectural fragments consisting manly of smaller more compacted or trampled discrete dumps. The sequence of (16417), (16415), (16409) & (16406) were all located in the northern half of Space 336 and contained very little cultural material, only occasional burnt animal and human bone. Sealing this was the last large single event layer (16402/16403/16405). Some of this material obscured the southern wall F.3096 so we can be sure this was very close to the demolition horizon of Building 77. The layer contained a large quantity of very colourful (blue, green, yellow white and black) slag generated from wall plaster, affected by the intense temperatures generated during the fire. The last layers in the sequence (16400) and (16401) were most likely the same layer being a mixed compact ashy silt. This clearly represented the interface or horizon between the demolition of Building 77 and the construction of the next building on the same footprint of its predecessor.

Space 83
The final phase of back fill in Building 77 (16400) was truncated by (16438) the foundation trench for a later wall which survived as just two courses of bricks and mortar to the north, wall F.3082 and a single course in the western wall F.3083 where it survived only as a mortar mortar bedding over the last metre. The western wall F.3086 also only survived as a skim of un-burnt mortar extending only 1m in length from its northern limit, this is reflected on the southern wall which extended just over 1m from its western limit. Even though the survival is limited it does indicate a continuation of use of the space created by Spaces 336 and 337. These later walls created Space 83. The walls were un-plastered and there are no signs of internal features but we can be almost certain that the space mirrored Building 77. This is because of the location of a crouched adult female burial F.3080, which cut the in fill of Building 77 and would have been buried below the north central platform of the later building.

Just to the south of Space 83 and eroding at the surface of the mound was burial F.6065. This was a multi burial of the grave consisted of six individuals although it is likely there are more as the cut continues under the newly placed wooden walkway. The individuals were interred from a building above which was eroded.

As this building was dug in isolation from neighbouring buildings it is difficult to comment on its phasing.

Roman & Byzantine Phase
Truncating the latest in fill (16401) was a large pit (16471), most likely Byzantine as based on one small pottery sherd found within its fill, this pit cut through the central dividing wall, removing evidence of any through space between the storage room and the living space in Building 77.

During the initial cleaning prior to this season's excavation several late intrusive Roman and Byzantine burials were identified in and around Building 77. The first of these F.3081 cut the eastern wall of Building 77. The skeleton was dorsally extended in an east west alignment and remnants of the coffin timber remained as well as a number of iron coffin nails.

Other late burials lying outside of the focus area were excavated due to their fragile condition and close proximity to the surface of the mound (see Human Remains this report).

External areas and the stratigraphic sequence – Lisa Yeomans

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Abstract
Excavations within the external areas between groups of buildings were conducted to examine the stratigraphic sequence of construction and use houses as well as gain information about nature of the build up of deposits outside of the houses. The results provide a sequence to the construction of buildings in the southern part of the 4040 Shelter and show which buildings were in occupation at the same time. Deposits excavated in the external areas comprise of midden dumps, deposits built up from general dumping with evidence that they did, at least at times, form external surfaces, and fire-spots from insitu burning activities. Without the protection of adjacent buildings, the walls of the houses facing onto the external area were affected by erosion and weathering necessitating repair and the addition of numerous phases of retaining walls.

Introduction and extent of work

The aim of the 2008 seasons work in Space 271 was to link the stratigraphy between two clusters of buildings. Before this season the relationships between buildings within the clusters was understood to a certain extent but there was no stratigraphic relationship between the clusters. One of these two groups of comprises of Building 54, Building 55, Building 57, Building 58, Building 59 and Building 64. The stratigraphic sequence for the western buildings is clearest with Buildings 55, 59 and 64 in occupation at the same time. A later level of building overlying these three is represented by Building 60 whilst, after Buildings 55 and 64 had gone out use with the area reverted to a midden dump following quarrying activity mainly in the area of Building 64 but also across the western side of Building 55. To the north are Building 48, Building 49, Space 229 and Building 52 forming a separate cluster. It is now clear that Building 52 was constructed from two buildings (Pre-B.52 East and Pre-B.52 West) with the central dividing double wall knocked through (Figure 52). A smaller Building 51 later replaced Building 52 after a fire.

Preliminary typological evidence, based on the sequence of artefacts from the South Area from Mellaart's excavations, had suggested that first of these two building clusters described was later than the northern cluster. Prior to 2008, there had been only limited excavation within external areas between the clusters of buildings with no complete stratigraphic sequence allowing phasing of the two clusters of buildings and it was clear that phasing of the buildings needed refining. In order to stratigraphically link the clusters of buildings, Space 271 was excavated with limits of excavation to provide sections through the deposits placed between the double walls enclosing the northern storage area (Space 247) of Building 55 and Space 291 on the eastern side and the northern end of Building 64 and the wall bounding Space 90 on the western side. Excavation was then extended to the NW into Space 60 (part of a continuation of Space 271) and to the SE into the area south of Space 229.

Stratigraphic sequence

Summary of stratigraphic phasing from work in the external area in 2008 is given in Figure 36 to show when building construction and modification occurred in relation to the use of the external space. The following descriptions and interpretations of deposits follow this sequence of changes and are given from the earliest part of the sequence to the latest. The earliest deposits were excavated in the east of Space 271 where an arbitrary limit of excavation was placed between the NE corner of Space 247 (Building 55) and south side of Space 256 (Building pre-52 East). This sequence of midden had already been partially excavated in 2004 below the remains of a very eroded building (Space 241) (Twigger 2004). This midden extended south in what was designated Space 232 and excavated in 2004 as units (11023) and (11024) (Tringham 2004). It was this continuation of the midden deposit to the west that was excavated in 2008 up to the arbitrary limit of excavation and it is clear that the midden would have continued further to the west under a series of deposits that formed a possible street showing a shift in use of this external area from midden dumping to a potential access route at time that Building 55 was constructed (see below). Excavation stopped at the level that the midden had been excavated to in 2004 with a sequence of 0.40-0.45m of midden excavated. Towards the base of this sequence there was evidence for certain activities taking place within the midden rather than the deposits just representing a series of waste dumps. The midden had built up against the southern walls of Building pre-52 East and Space 229. These two buildings were constructed prior to the build up of the midden and it seems likely, although there is no stratigraphic proof, that other buildings in the cluster (Building 49, Building 48 and Building pre 52 West) were also built before these deposits accumulated to the south of the cluster. It is known that Building 49 was in use for a long-time and definitely predated Building 51.

In the midden sequence the earliest unit (17725) excavated was fire-spot with the ash from the burning activity still insitu. The spread of the ash measured just 0.40 x 0.33m in extent with a depth of 0.02m and was just the south of where the walls of Building Pre-52 East and Space 229 met. This was the result of one individual event rather than recurring use. Charred bone was present in the ash and, together with the phytolith and flotation sampling, it may be possible to interpret the material burnt and reason for the burning event. This differs from many of the other fire-spots encountered where all that is left is the scorched pre-existing

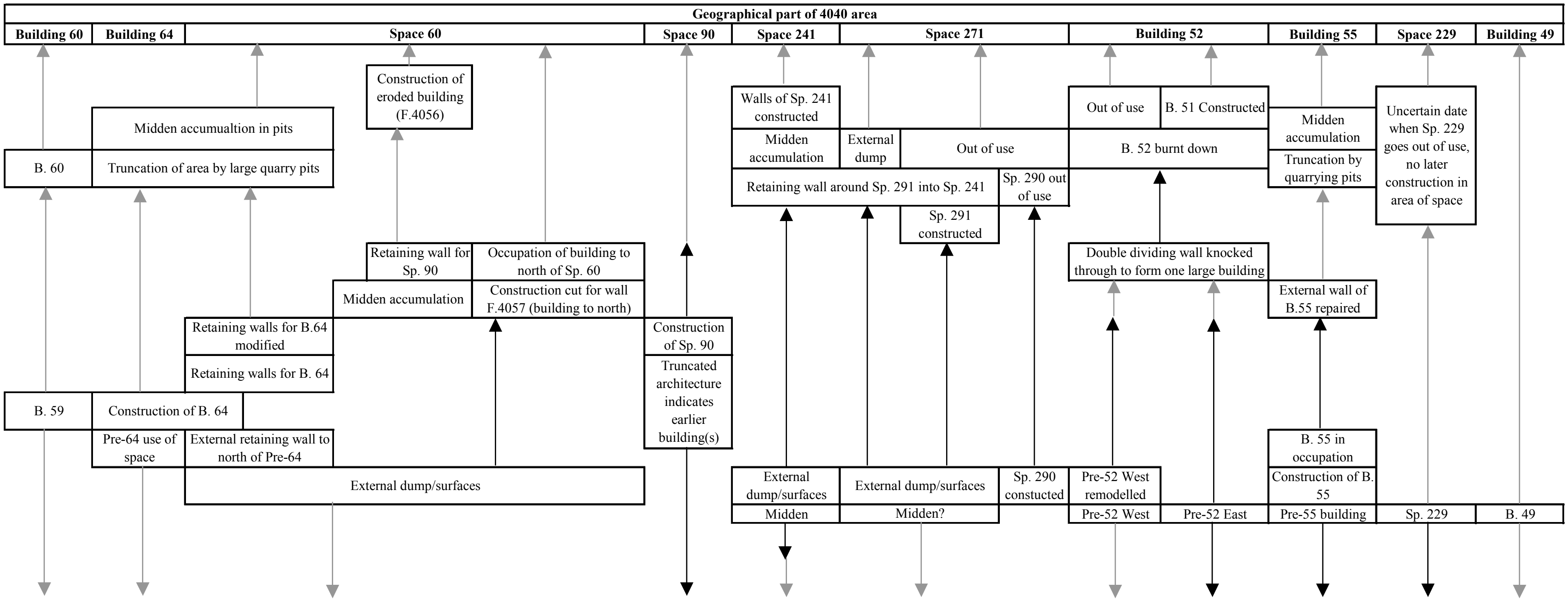
Figure 35: Plan of southern structures 4040 Area

material on which the fire was set. This was sealed by approximately 0.05m of laminated midden deposits (17724). Above this was another fire-spot (17722) in roughly the same location as the earlier fire-spot but there were no ash deposit left insitu above the scorched material. Further south were traces of a patchy plaster surface (17723) that had been partly scorched. This indicates that a temporary surface had been laid down in the midden on which a specific activity had taken place and that the burning in the midden areas are not just related to the burning of rubbish but the preparation or processing of a material in some way. These two features were sealed by a thick build-up of midden (17721/17720/17719/17718), which was excavated as a series of layers following tip-lines and slight changes in the midden deposit. These deposits produced significant assemblages of animal bone, stone and obsidian as well as bone points and figurines.

There was a major change in the organisation and use of the space in the external area following the deposition of the midden. Building 55 was constructed and this is clearly visible in the sections at the limits of excavation placed to see the sequence through the NE corner of the double wall of Building 55. A construction cut (17730) had been dug (0.10m in depth) into the top part of the midden and cutting the wall of an earlier building. The double walls of Building 55 were constructed in this cut in one event. This is show by the same brick and mortar used in both the main wall of Building 55 and the retaining outer wall (F.1599). Building 55 is a large building and there was obviously sufficient resources to ensure that, from the outset, the problem of having an outer wall facing an external space was compensated for by building a wide double wall around the northern and NE corner of the building. In many of the buildings the problem was not tackled in the construction of the building but at a later date by adding thin retaining walls as the original walls started to suffer from erosion and exposure to the elements. The midden removed from the cutting of the construction cut was used as backfill and the disturbance of the originally laminated midden deposits is clear in section.

It was also at approximately this time that there was a phase of remodelling to Building Pre-52 West. This saw the western wall F.4059 and the oven built into it SW corner go out of use and a new western boundary constructed further east along with a new oven (see Mackie 2008 archive report). At the same time an additional space (Space 290) was built onto the southern side of the building with a crawl-hole providing access. This brought the southern limits of the building in line with the southern limits of Building Pre-52 East and during the construction part of the western wall of Building Pre-52 East was slightly cut by these added on walls.

Figure 37: View through external area Space 271 and associated structures to N and S. Looking W.



Simplified stratigraphic diagram showing the sequence of building events in part the northern part of the 4040 Area shown by Space and Building area. The black arrows indicate continued use of the building/area until a later stratigraphic event; the grey diagram showing the seque buiding/use of area probably continued but there is no stratigraphic relationship to indicate the exacat timing relative to other stratigraphic events.

Figure 36: Phasing of external areas with associated structures.

It was not only the construction of a new building, albeit in the same location as an earlier building, and modifications to pre-existing building layout that changed in this area of the site. Although the boundaries of the external space between the two clusters of building had not shifted to any great extent, the deposition of ashy midden ceased. There was a build up of deposits (16719/16796/17714) within the external space but these were dumps of more clay-rich material, obviously derived in part from broken up mud bricks. Other material was clearly discarded in this area as moderate quantities of animal bone, stone; shell and obsidian were recovered from the sieve. In section these deposits appeared coarsely laminated and may well have functioned as a walked upon route between parts of the site. These deposits appear to be the same as the deposits excavated by Tringham (2004) as sealing the midden in Space 232. Excavations of these deposits show that they extended though the area designated Space 271 and into the large open area to the NW (Space 60). This build-up of external dumps continued with the deposition of slight variations of the material (excavated as 16717, 17709, 16716 and 16715). Above these deposits was a clear indication that the area had functioned partially as a surface with a smooth, flat, thin deposit (16714/16795) interpreted as a layer of trample including frequent phytolith remains suggesting that a spread of plant remains had deliberately or accidentally become incorporated into this layer of trampled material.

Following the use of the surface in the external area (Space 271), the deposits continued to build-up and insitu activities are represented by fire-spots (17706/14194 and 16700). In the area of Space 60, there was the construction of additional, retaining wall on the north side of a pre-building 64 wall. The top of the retaining wall has not been exposed under Building 64 but the walls of the structures within sequence in the Building 64 area must have shifted slightly with the construction of Building 64 over the top of the retaining wall rather than over the original wall of the pre-64 structure. The retaining wall had been built in a construction cut (16790) truncating the external surface (16714/16795) indicating that Building 64 was constructed later than Building 55. Although the form of Building 64 as a wedge-shaped building in the area between Building 55 and Building 59 would suggest that it was a later building fitted into the space between the two, larger more conventionally shaped buildings; the building plans follow earlier use of space and Building 64 was constructed at a later dater than Building 55.

Sealing the backfill of the construction cut (16790) and extending over western part of Space 271 and the southern part of Space 60 was a layer of demolished mudbrick material mixed with some other dumped waste (14196/16786). This measured 0.18-0.27m thick and, given the location, it seems highly likely that this deposit was partly the result of the demolition of the walls of the pre-64 structure. Stratigraphically this fits since it seals a pre-64 retaining wall and is below dump deposits respecting the northern wall of Building 64. These large dump deposits (17705/14191/16736/16786) cover the entirety of Space 60 and Space 271 and probably accumulated as the area was used as a route across the site with some dumping of waste.

Subsequent to the deposition of the large scale-dumps there was a number of construction events. The exact timing of all these episodes is not certain as they are separated physically and there is no stratigraphic link to indicate which modifications happened before others. To the north of Building 64 a series of retaining walls were constructed to reinforce the northern wall of Building 64 (F.2011). The first of these was localised to the western part of the northern wall for Building 64 (F.2011) perhaps to reinforce a limited area of erosion. A length of four bricks and three courses were set into a shallow (0.15m) construction cut (16785) and formed the retaining wall (F.4063) which abutted the western wall of northern storage space to Building 59 and was built to the north of wall F.2011. This closed-off a small wedge-shaped gap between Building 64 and Building 59. It was not long before it became necessary to reinforce the rest of the northern wall of Building 64 and a second construction cut truncating the eastern part of the first retaining was dug so that the retaining structure could be extended to the east and continue around the NE corner of Building 64 to abut the external wall of Building 55. This was the early phase of wall F.2221 that was subsequently added to with a different type of brick and mortar to form three additional courses to the retaining wall running the length of the Building 64 to abut Building 59 and extending around the northern corner. The southern limit of the wall was truncated away by the large quarry pits dug though Building

64 (see 2006 archive report). This later phase of wall F.2221 was constructed from distinctive white marl plaster mortar. This wall was itself abutted by a repair (16746 and 16747) to the external wall F.1599 of Building 55 indicating that Building 55 was still in use. Further repairs to this wall (16742 and 16743) also suggest that Building 55 was in use for a long time and this fits with the evidence from inside Building 55 where there was thick build-up of plaster on the walls and other features.

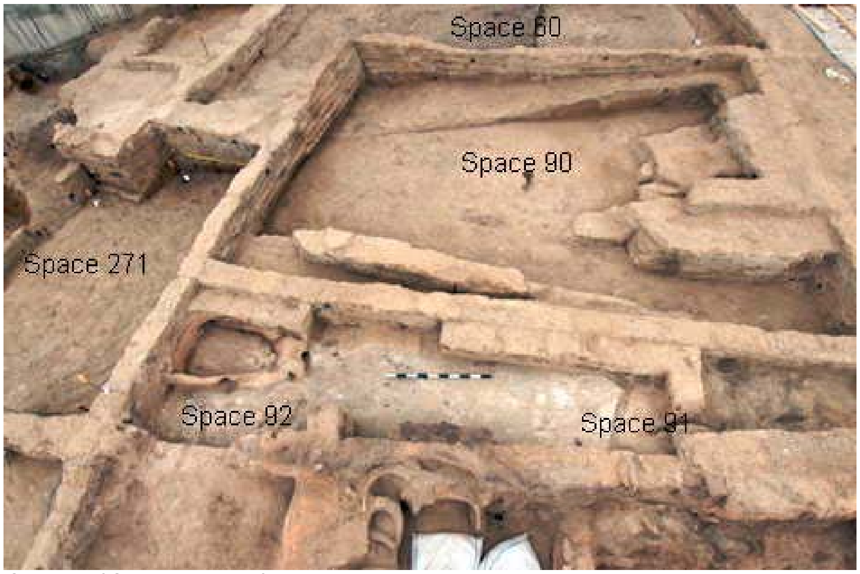


Figure 38: Creation of Space 90 to W of Pre B.52 west. Looking W.

At roughly time there was the addition of a large space (Space 90) onto the western side of Building Pre-52 West (Figure 38). On the southern side (wall F.2139) the walls were set in deep construction cut (16755) truncating earlier external deposits in Space 271 and cutting the earlier wall (F.4059) of Building Pre-52 West. This construction cut was clearly visible truncating the oven from this early phase of the building. The construction cut was also visible along the eastern N-S aligned wall but was not along the western N-S aligned wall where the western limiting wall of Space 90 was directly on the sloped underlying deposits. Numerous types of bricks were used in the construction of the wall and the reuse of old bricks is evident from the presence of plaster adhering to some of the bricks within the construction cut as well as elsewhere. Minimal effort had gone into ensuring the corners were well built with overhanging bricks protruding into the external space. The area that was enclosed by the walls (Space 90) must have been an open space and no effort had been expended on removing upstanding bits of architecture from earlier buildings. One suggestion is that the area was used to grow plants or it may simply have functioned as an enclosed outdoor space that could be used by the occupants of Building pre-52 West. There is no evidence for any penning of sheep or goats and the interpretation of the use of this external space remains open to interpretation.

The next modification within the area saw the centre of the double dividing walls between Building Pre-52 East and Building Pre-52 West removed. Subsequent to the modification of the two pre-52 buildings into one house (Building 52) three walls defining a narrow, slightly trapezoidal space (Space 291) were added to the southern part of the Building 52. These three walls (F.4051, F.2011 and F.1489) were added to the southern end of walls F.2010 and F.2017 resulting in an enclosed area measuring 4.60m in length by 0.46m at the narrow western end to 1.10m at the wider eastern end. The limited size of this area would have limited its use and there was no access into the space from Building 52, which it was tacked onto. The functions of these walls are therefore interpreted as forming a retaining structure built to enclose and protect the southern limit of the building. A patchy floor found in the lowest part of the infill (17715) of Space 291 suggests that it may have had a limited function at times perhaps as additional open storage area. The most important function of the construction, however, appears to have been the protection of the southern walls of the house. The construction of the three walls appears to have been more haphazard than well planned. The bricks used varied in composition as if reused and the corners of the structure were not well finished as the bricks overhung one another as if any available bricks were used and no effort was made to cut them to size. Spaces 291 and 92 would go out of use and where infilled prior to the fire that destroyed the building and resulted in the construction of the small Building 51 (Bogdan et al. 2006 Archive Report).

In the northern part of Space 60 the external deposits were truncated by a relatively large construction cut (16740) for the southern wall (F.4057) of a building to the north. None of this building has been excavated but may form part of a contemporary group of buildings with Building 77 to the north. At the same time, stratigraphically, the deposition of material in Space 60 changed and a midden deposit (16728) accumulated in a central depression within the area. At this time the wall of Space 90 was reinforced with a single course of narrow mudbricks overlying the midden and sealing the construction cut for wall F.4057. This suggests that Space 90 was still in use at this time. Above the construction cut for wall F.4057 was another E-W aligned wall (F.4056) that was very eroded. Erosion also seems to have affected the top of the midden deposit where lenses of eroded dumps and midden were found (16726).

In the eastern part of Space 271 the walls surrounding the external area also needed to be reinforced. The initial attempt at this was a short section of narrow bricks of four courses along the eastern end of the south face of wall F.2011 and set within a construction cut. This subsequently had to be strengthened and three courses of the narrow bricks were added along the whole length of the southern face of wall F.2011. This wall F.4050 had been partially dug further to the east in 2004 but would have dogged legged to the south. It was picked up again further south where it was recorded in 2004 as wall F.1752 with the eastern part excavated. To the NE of the retaining wall midden deposits (17702) continued to accumulate after its construction.

Summary and discussion
The stratigraphic evidence from the excavation in the external area between clusters of buildings has demonstrated a complex series of building and modification events. These show that the initial construction of buildings in the cluster to the north was earlier than the central cluster but that for a long period these two groups of buildings were in use at the same time. Demonstrating that buildings were in use at the same time is important for the analysis of the spatial layout of the settlement and also associating the large quantity of finds from the external spaces with the use of buildings.

Review of Building 52 phasing – David Mackie

Supervisors: David Mackie*, Cordelia Hall*

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Space 91 and Space 92
Space 91 and Space 92 form a narrow trapezoidal side room between Building 52 to the east and Space 90 to the west (see Figure 35). The spaces are divided by an engaged pillar F.2184 projecting from wall F.2106. In 2005 the northern end of Space 91 was partially excavated revealing a burial cut (10289) through eroded floors (10306) and partly exposed an access, access F.2186 from Space 93. These spaces were further modified by the insertion of wall F.4062 and F.2185, which respects access F.2186 and closes off the narrow space at the northern end of Space 91.

Wall F.4062 and F.2185 form part of the same phase but the wall was truncated in antiquity.

This season has seen the removal of infill from the internal Spaces 91 & 92 in order to understand the relationship of these Spaces to Building 52 and Space 90 with an attempt to phase these modifications. Limited excavation and cleaning also took place within Space 271, Space 93 and Space 251 (Figure 39).

In Space 92 heavily denuded floors (16704) sealed a neonate burial (16724), which was in close proximity to another (16713) whose relationship to the floor surfaces was unclear. These burials cut into an infill layer (16718), which is the same as infill layer (16701) within Space 91 to the north.

Figure 39: Spaces 92 & 91 with oven F. looking north with oven F.4060 in foreground.

The removal of this infill (16701) exposed the burnt plaster and render lining (16779) to access F.2186 and a small area of plaster (16727) on the northern side of the engaged pillar F.2184 that forms the partial division between these spaces. It is possible that this patch of plaster (16727) could be the remnants of a scoured out surface, however, it could be a fragment of collapsed wall plaster.

The remaining infill (16745) from Spaces 91 and 92 was removed exposing a plaster floor (16765) and (16744) covered by a thin dirty layer (16764). This floor was associated with an oven F.4060 in the south west corner of Space 92. The oven abutted wall F.4061 and the southern wall F.2012 of Space 92 (Figure 39). On the surface of the oven was a cluster (16762) comprising three ground stone fragments (16762.x1), (16762.x2), (16762.x3) and two pieces of animal bone.

The floor surface (16765) and the infill (16745) within Space 92 appeared to continue through an access from Space 94. Although unexcavated the heavily burnt plaster floor surfaces associated with Building 52 within Space 94 overlay these deposits. It appears that this access was blocked with infill when Space 92 was backfilled and the level raised before the modifications in the construction of Building 52. This can also be seen to the north in Space 91 within the access from Space 93, access F.2186. The earliest phase of this access consisted of the access with a small niche F.4065 on the southern side within wall F.2106. The northern side of the access is partly blocked by the east west return of wall F2185 which forms a small recess. The threshold was then raised by blocking with mud brick (17731) and the niche F.4065 was infilled. The recess was then infilled with (17701) and the raised threshold and blocking was rendered and plastered (16799). This phase of the access is narrow and the south western edge of wall F.2106 appears to be heavily worn.

Space 93

The space was excavated in 2005 and contains four well preserved storage bins along the north wall F.2008 and western wall F.2007. Access to this space is through the eastern wall F.2186.During this season the room was cleaned for display and two of the storage bins were further excavated. The largest storage bin F.2003 is situated in the north east corner of the room and the remaining infill (16756) was removed to expose a well preserved grey plaster lining (11921). In the south west corner of this bin the carbonised remains of a post (16758) was recorded within the bin wall (11922) providing internal support to the structure. Adjacent to storage bin F.2003 in the north east corner is storage bin F.2002. Within this bin the remnants of a fill (11908) were excavated along with fill (16763), which contained a broken obsidian point 16763.x1 and a polished stone axe head 16763.x2.

Space 290
The space was originally recorded in 2005 as platform F.2009, in Space 254 but was reviewed and reallocated as a space, Space 254 was then renumbered Space 291 (Eddisford 2005 Archive Report). The infill was removed in 2006 and this season some limited excavation and cleaning took place. Space 290 is accessed from the north through a access F.2181 in the southern wall F.2012 of Building 52.The small rectangular space is comprised of wall F.2010 to the east, wall F.1486 to the south and by F.1488 to the west. This cut F.1488 cuts a north south mud brick feature which is not a continuation of the east wall F.2013 of Building 52.The feature was not excavated but cuts the western wall F.2014 of Space 255. Although the southern wall F.1486 aligns with the southern wall F.2016of the Space 255, it is a later construction.

Within Space 290 a small area of truncated floors in the south east corner of the room appeared to seal an in filled (16778) shallow basin F.1487. Another in filled (16775) shallow basin F.4061 was excavated to the north. A series of floor surfaces (16777) were removed across the rest of the space. The infill removed in 2006 like the infill within Space 91 & Space 92 was not burnt and appears to have been deliberately 'closed'. It is not clear whether this space went out of use before the construction of Building 52 or after the destruction of Building 52.

Space 255
This space is comprised wall F.2014 to the west, F.2016 to the south, F.2017 to the east and F.2015 to the north. The space was originally recorded in 2005 exposing plaster floor surfaces and two shallow basins in the centre of the space. Space255 appears to form the southern end of a trapezoidal building pre Building 52 and adjacent to an earlier phase of Building 52. Access may have been from the north where F.2015 originally formed a partial partition between spaces. This season has revealed subsequent blocking of this access by two roughly constructed walls, which have not yet been allocated feature numbers.

South Area

Introduction to the South Area excavations in 2008 – Shahina Farid
Our work in the South Area focused on the sequence of buildings B.10, B.44, B.56, B.65 and B.75 located at the highest step to the east of the shelter. After a succession of similarly aligned and occupied buildings (B.10, B.44, B.56, B.65), the phase of the earlier structures represented by Building 75 and a series of smaller and less permanent buildings and open areas was excavated. The latter had been used for dumping and for a series of activities including fire-spots. These spaces were associated with structures housing very large ovens which appear to be adjacent to the large ovens excavated by Mellaart in the 1960s (E.V.5).

In addition, the area was extended to the south to excavate the associated midden horizons to the above series of structures.

Further work in the South Shelter took place on the lower step, west of the above sequence. Here, the area where Mellaart had stopped work at Level VI (E.VIA.32, E.VIA.27 & E.VIA 28), was defined and recorded in order to address the phasing issues in this area (see Farid Phasing, this report).

Figure 40: Resuming excavations in the South Area. Upper ledge – excavation of Building 75 and associated spaces, lower ledge - recording horizon of 1960s Level VI

Building 75, middens and buildings 80 & 70 - Roddy Regan, Freya Sadarangani and James Taylor

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Introduction
The excavation area was delineated at the end of last season. At the north west of the area lay Building 75, within walls F.2623, F.2643 and F.2624, these forming Space 328. To the south of this was Space 332 delineated by walls F.2644, F.2643 and F.2644. Space 333 lay south of wall F.2644 and west of wall F.2625 which also defined Space 329 to the east, its southern extent delineated by wall F.2641 (see Figure 42) Continuing on from last year the excavation area was extended to the south in order to embrace the full sequence of midden deposits in the external space to the south of Buildings 44, 56 and 65. The extent of the midden deposits were bounded to the west by Mellaart's excavation and to the north by the southern walls of the sequence of the buildings.

Midden and Building Sequence
One of the main objectives of this season was the excavation of the midden sequence located to the south of the buildings excavated in previous seasons (Building 10, Building 44, Building 56, Building 65). An additional aim was the continuation of the trench down, through Building 65 and Space 333 sequence, to both understand these phases more fully (through a wider exposure) and to obtain the a fuller exposure of the underlying 'burnt buildings'.

Several broad phases of midden deposition have been identified, these defined by their relationship with the successive construction, use and demolition of Buildings 65, 56 and 44. This fairly linear sequence was interrupted by the construction of two walls in the southwest portion of the trench; these walls may have formed the corner of a building that had been heavily truncated to the west and south by Mellaart and/or erosion.

Upper Midden

This upper midden sequence ((14559), (16253), (16258), (16259), (16260), (16262)) was mainly represented by deposits that respected the south face of Building 44 (F.1341) and the north and east faces of walls F.2645 and F.2646. These middens sealed a 4cm thick trodden surface that sloped downward from north to south which in turn sealed the foundation cut for wall F.2645.

Construction of Walls

This phase was represented by the construction of walls F.2646 and F.2645 in the southwestern corner of the trench, which formed the northeastern corner of a possible building. Wall F.2646 was orientated north-south and was located outside the limit of excavation, wall F.2645 was orientated east-west and was located 1.55m south of Building 44's southern wall. Both were heavily truncated to the west and south by Mellart's excavation and the shelter foundations respectively. East-west wall, F.2645, was constructed of compact yellowish brown sandy silt bricks, (16281), with an average size of 630mm by 270mm by 90mm, and loose mid grey ashy sandy silt mortar, (16282). The wall's foundation course stepped out approximately 0.06m.

Figure 41:Section through mi.ns and associated walls of B.10 – B.75 sequence

Building 44 Midden (Space 319)

This phase was represented by a sequence of midden deposits that respected the south face of Building 44's foundation (F.1341). The foundation cut truncated midden deposit (16507) which had a trodden surface upper crust. As with the underlying midden, all deposits sloped downward from north to south. At the southern end of the trench midden (16534) was truncated by fire pit cut (16525), which mainly extended beyond the southern limit of excavation. Pit (16525) was 0.60m (E-W) by 0.05m (deep). Scorching was recorded on the sides and base of the cut, (16520), and was filled with yellow ash, (16519). Rake out from the pit was identified sealing fill (16519) and spreading out a little way to the west, (16516). Below the pit midden deposits, (16568), (16534) sealed buttress/levelling deposit (16559).

Construction of Building 44

This phase was represented by the demolition of Building 56, landscaping of the area, and the construction of Building 44. The southern edge of Building 44's foundation cut was not

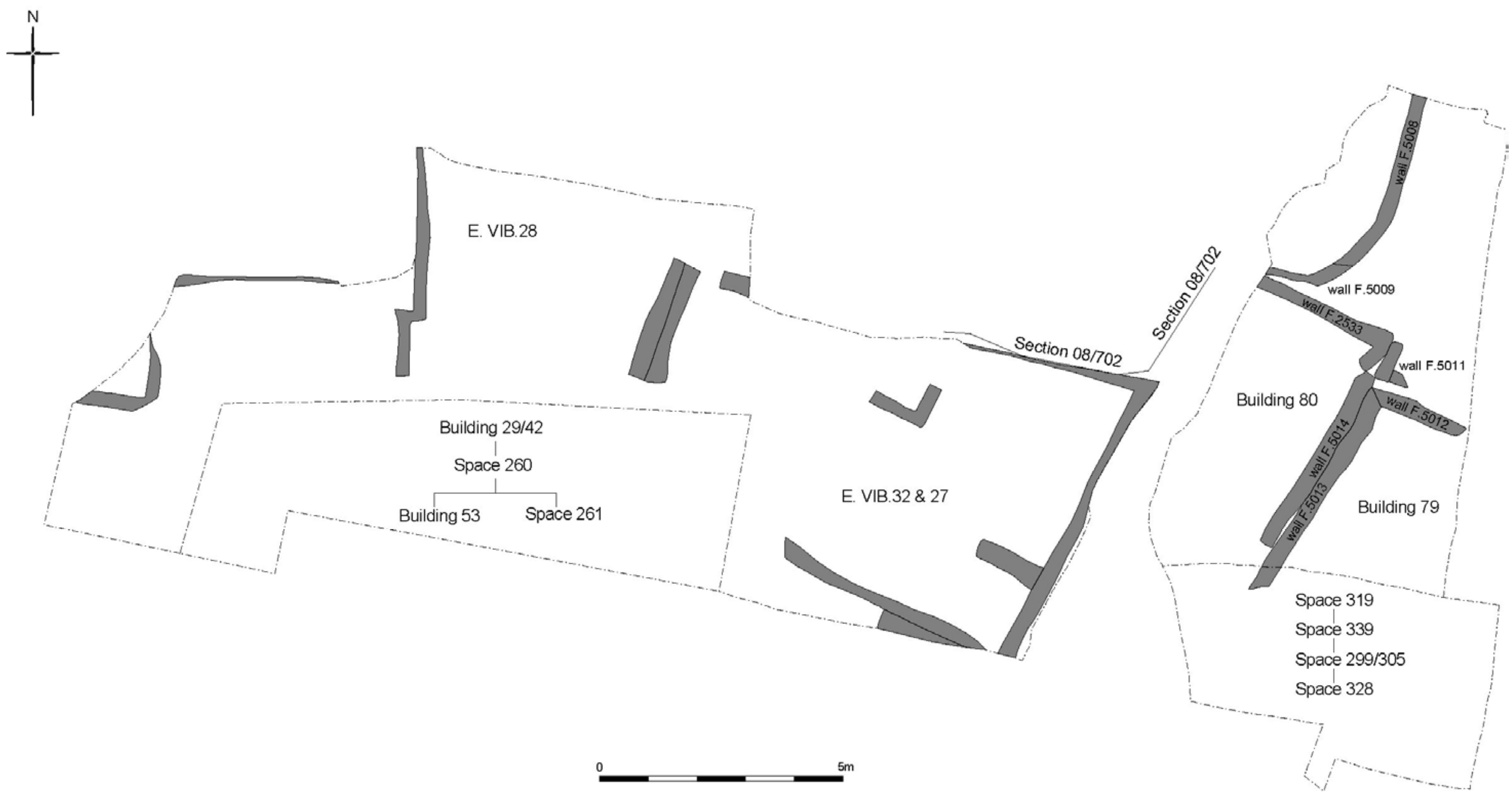

Figure 42: Areas of investigation in the South Area 2008

visible within the trench although a northern edge had been picked up in previous seasons. Although it is possible that the wall was trench built to the north, it is more likely that the cut continued to the south, removing most of Building 56's southern wall and horizontally truncating much of the midden that would have built up against its south face. The foundation courses of Building 44's south wall (F.1341) were substantial, measuring 0.9m wide by at least 4.8m long, by 1.0m high. Its bricks comprised compact yellowish light brown sandy clayey silt, with an average size of 500mm by 360mm by 60mm, (16577). On at least two of the bricks the remnants of a plaster face were noted inside the wall, suggesting that these bricks had been robbed and re-used (possibly from the walls of Building 56). The wall's mortar was a compact mid grey sandy silt, (16578). To the north make up layers had been laid to raise the ground level prior to occupation (see *** Archive). The superstructure of the wall was slightly narrower, measuring 0.55m (E-W) and with a surviving height of 0.32m, (16270), (16271). As with the underlying wall F.2096, mudbrick material was banked up against the south face of the foundation, (165590), which also spread out a little forming a levelling layer. The banked up portion was 0.35m thick and in places appeared to be bonded into the lowest foundation courses.

Building 56 Midden and Fire Spots (Space 339)
This phase was mainly represented by midden deposits interspersed with fire spots and fire pits. All midden deposits sloped downward from north to south. Layered midden dump (16590), which was rich in phytolyths as well as bone and charcoal fragments overlay two burnt features. A circular fire pit was identified in the central portion of the trench, 0.60m (E-W) by 0.53m (N-S) by 0.12m (deep), (17011). The cut's sides and base were heavily scorched, (17006), and large lumps of charcoal (30mm) were recorded at the base of the pit, (17010), sealed by yellow ash, (17005). Approximately 1.40m to the northwest of this, a spread of scorching was identified, (17008), sealed by a spread of dark grey sandy ash, (17007). These fire spots overlay midden dump, (17017), which at the southern limits of the trench sealed two further fire spots, (17035), (17029), both with associated yellow ash deposits, (17027), (17033). These overlay midden deposit (170390 which had a trodden upper surface. Underlying this was a spread of burnt building material, (17042) which in turn sealed a silty ash deposit, rich in charred seeds, (17044). This overlay midden (17047) which was scorched by fire spot (17046). This spread over an area, 1.20m (E-W) by 1.00m (N-S), in five discontinuous patches. These patches of scorching may represent five individual pyrotechnic events or one relatively large fire with differential scorching patterns. Underlying midden (17047) was a fire spot, located in the southeastern corner of the trench, (17057), this overlying a 0.15m thick ashy silt midden (17058), which was a mixed deposit with lenses of dark grey charcoal rich ash, frequent large fragments of animal bone.

Construction of Building 56
This phase was defined by the demolition of Building 65's southern wall, F.2507, possibly represented by a spread of brick crush at the western end of the trench, (17078), and the construction of the southern wall of Building 56 (F.2069). At the western end of the trench feature F.2096 was founded on the brick crush (17078) and at the eastern end the wall was built within foundation cut (13363). The southern wall of Building 56 was constructed with compact mid yellowish brown sandy clay bricks, (13362) and compact orangey brown clay mortar, (13361). The wall was 0.8m wide by 5.5m long, truncated at its western end by Mellaart's excavation, by 0.45m high. The wall, along with the subsequent midden accumulation to the south, had been horizontally truncated by the construction of Building 44. A deposit of mudbrick crush was banked up, respecting the southern face of wall, forming an informal, short buttress, (17071).

Building 65 Midden and Fire Pits (Space 299/305)
Following the construction of Building 65 and the creation of Space 299/305 a number of midden deposits built up, respecting the south, west and east faces of the wall. These midden deposits were interspersed with fire pits and spots. Two small fire spots at the western end of the trench, (17080), (17081) sealed a spread of midden, (15717), which overlay a 0.04m thick spread of white ashy marl with occasional darker clay lenses (17086) and may represent plaster mixing activity. The marl overlay a 0.05m thick trodden surface, (17087). Beneath this lay midden (17099), which contained bone cluster (17094) and lay directly overlay fire spot (17300) may be entirely coincidental and not associated with any

burning. Bone cluster (17094) comprised three articulated vertebrae (sheep?), scapula, ribs, and various other bones, spread out over an area 1.0m (E-W) by 0.4m (N-S). There were no signs that the bones had been burnt. Approximately 1.4m to the east of this, a scatter of small animal bones was identified, also sealing (15743) and covering an area 1.80m (E-W) by 1.10m (N-S) and sloped downward from north to south, (17097). At the western end of the trench a small area of scorching was recorded, (17300), scorching midden (15743). The diminutive size and the absence of associated ash deposits may suggest that fire spot (17300) had been cleaned out. A small portion of a further fire pit was excavated to the east of the trench, (17305), which as seen, measured 0.40m (E-W) by 0.10m (N-S) – before extending into the southern limit of excavation – by 0.05m (deep). Fire pit (17305) was filled with loose dark grey to black silty ash, (17304). Underlying this was a powdery loose fill/layer that was a mixture of light brown, pink, orange, yellow, blue, purple and green sandy clayey ash, (17307). This colourful deposit overlay three fire pits. The earliest of these was located at the western end of the trench, was circular in plan with an undulating base, and measured 0.66m (N-S) by 0.72m (E-W) by 0.12m (deep), (17311). The upper sides of cut (17311) were clearly scorched - this scorching continued a little way to the north, at the top of the cut, (17310). Fire pit (17311) was filled with a loose compound deposit, composed of mid green, mid yellow and pink ashy clayey silt, with frequent charcoal flecks and larger fragments (<20mm), (17308). To the southeast of this a further fire pit was identified, which measured 0.9 (E-W) by 0.44m (N-S), before extending into the limit of excavation, by 0.17m (deep) (17313). Scorching was identified at the base and sides of the pit and a concentration of charcoal was revealed at the southwestern end, (17309). Midden deposit (16246) sealed midden (16247) which was the first to respect the south face of the wall of Building 65. Both deposits had been partly excavated to the northwest earlier in the season.

Construction of Building 65

The foundation cut for the southern wall of Building 65, (17325), stepped down to the south to accommodate a stepped foundation, F.2507. The southern wall of Building 65 was 1.94m (E-W) by 0.42m (N-S) by 1.0m (high), (17319) and (17320). The wall was constructed of nine courses of stretchers, with an average brick size of 600mm by 300mm by 80mm. The bricks comprised of compact reddish brown clayey sand, (17319), with mortar composed of moderate to compact greyish mid brown sandy silt with moderate charcoal flecks, (17320). Two buttresses were structurally bonded into the south face of the wall, at the eastern and western ends of the wall; both measured approximately 0.3m (E-W) by 0.16m (N-S) by 0.32m (high).

The foundation cut for the south wall of Building 65 truncated deposit (16248). With the exposure of Building 65's south wall it was apparent that Spaces 299 and 305 (excavated in 2007) were one un-interrupted external space. No wall was revealed within the trench to bound this external space to the south.

The stepping down of foundations at a wall's southern end and the buttressing of the south face, albeit not as formally constructed as Building 65, was repeated higher in the sequence with the south walls of Building 56 and 44. The founding of these walls on both a north to south downward slope and the presence of underlying loose midden clearly necessitated added support to the south face of these walls.

Unresolved Wall(s)

One or possibly two directly overlying walls were identifiable in the southern limit of excavation, running obliquely to the section, orientated slightly north of west to slightly south of east. There was a clear distinction in the composition of the wall(s), the upper four courses comprised orange slightly silty clay bricks, (17343) with mid grey slightly silty clay mortar (17344), F.5016. The lower courses were composed of mid grey slightly silty clay bricks, (17015) and mid orange slightly silty clay mortar, (17345), F.5017. Whether these differences indicate a foundation and superstructure – constructed with different materials – or two separate overlying walls, was not resolved. If they are two separate walls, the section suggests that the upper wall was constructed prior to dump (16590), which would roughly be in phase with the construction of Building 44. The phase of the underlying wall's construction was not at all resolved.

Building 75, Space 328

Building 75 was situated along the northwestern edge of the area, and is primarily defined by walls F.2623, F.2643 and F.2624 (Space 328) and may have incorporated the raised area to its immediate north. The western extent of this room was truncated by a combination of natural erosion of the mound and previous excavation works. The room was probably originally rectangular measuring c4.5m from north to south. Within the structure an oven was located against the southern wall of the room. To the north of this were a plaster basin and a sequence of plastered floors, which may have been the base of a series of bins to the north of the space. There were also some residual structures that may have been associated with a platform on the western edge, although these were very badly damaged by the truncation along this side. To the northwest of the space were five small open hearths, (average diameter 0.5m), which all sat in shallow concave depressions, some containing residual fuel. Most of them were in use on their own, being sealed variously by different floor surfaces. Three burials were recovered from the early building sequence.

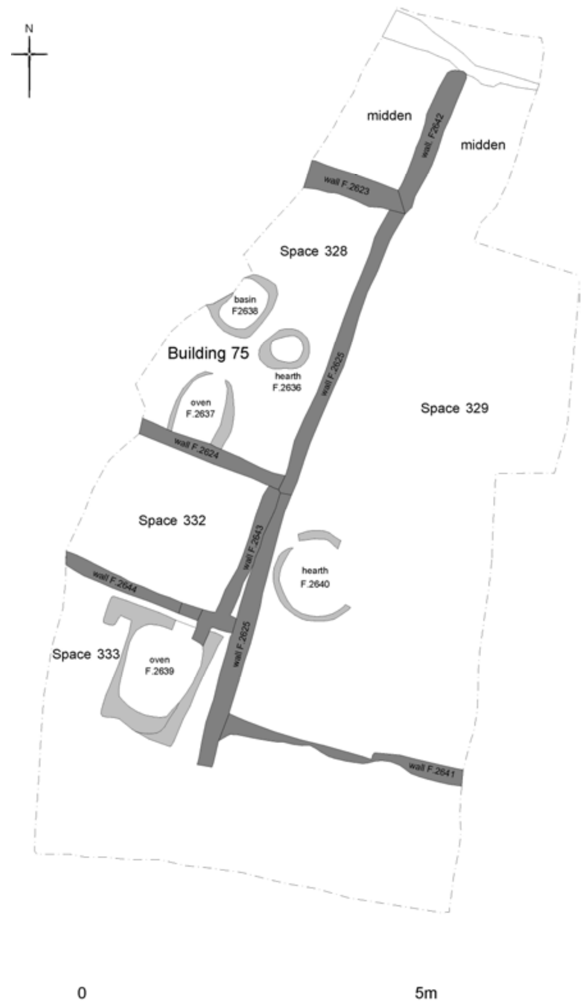

Figure 43: Building 75 and associated spaces as exposed last season.

Later Oven and Surfaces

Lying on the floor of the building west of the oven was cluster (15751), containing at least three scapulae (one plastered) along with some stones and a fragment of pottery, these objects appearing to have been deliberately collected and left in the building. The final use of the oven F.2637, was marked by an ashy build up, (15785), which was sealed by brick collapse and another ashy lens, (15783) and (15781). This sealed the upper floor, (16264) similar in composition to the lower floor sequence, but more patchy and founded on a dense foundation deposit, (16268), which supported a packed cluster of stone and highly fired clay fragments (resembling fragments of modern redbrick) (16275). This latest oven floor was approximately 10mm thick. Two more formal oven surfaces were identified with the later build/use of the oven, suggesting that the structure remained in use and maintained for almost as long as its earlier phase. The earliest of these, (16284), was very well preserved by scorching or baking, approximately 30mm thick. At its southern end it showed signs of another residual surface, which may have been scoured out in a repair event. This surface was founded upon a thick band of make up material, (16292), which in turn sealed some residual ashy material, (16504). The make-up and surface was porous, showing signs of organic material which may have been used as a temper. The surfaces lay within the rebuilt superstructure which overlay an early oven sequence. The rebuilding event involved the construction of an internal course of roughly formed sandy-silt mudbrick and bonding material (16587). Indeed there was so much bonding material, it seems that much of the superstructure was almost moulded. The entrance of the oven superstructure remained at the northern end, the earlier superstructure was not obviously modified in itself (at least at foundation level) and the floor sequence continued as before, suggesting that this was more of a repair or strengthening event rather than a rebuild.

Outside of the oven to the west, several deposits built up against its outer face. A stone cluster was deposited against the southern wall, (16551). The latest surface directly associated with the oven (on the outside), was (16538). This was a small patch of dirty surface sealing the cluster (16551) against the southern wall. This was finally sealed by the make-up for a residual white marl plaster layer, which ran along the western side of the oven and continued a little way to the north, although almost nothing remained of the plaster surface except occasional patches.

Located near the centre of the room close to the northern end of the oven was a plastered pit-hearth F.2636, set into cut (16592) which was 0.54m in diameter 100mm deep. This contained the remains of a fragmented pottery vessel within an ash charcoal deposit left within hearth F. 2636, (16221). This feature had a second discrete phase of use, marked by a repair and re-plastering of the cut, (16263), which sealed some of the primary fill. The primary fill, (16279), had a very high charcoal content, suggesting that it may have been a fuel deposit. Also in the centre of the room there were two shallow scorching events or fire-spots, (16511) and (16521) in the cut (16526). The former was little more than a discoloured patch to the east of the room. However the latter was a more formal fire-spot, consisting of an ashy fill in an 80mm deep cut (c.0.60m diameter).

Associated with the latest sequence in the northwest of the room was the construction of a white marl plaster basin, (16287, F. 2638) and associated floor, (16276), adjacent to the east side of another highly residual platform/bench structure, (16531)/(16532). The latter was probably a rebuild of an earlier structure. The floor was approximately 20mm thick. The basin was set 0.15m lower than the floor in the base, lipping up 50-100mm around the edges (incorporating the underlying residual room furniture on its western side). It was 1.1m long by 0.7m wide, orientated northeast-southwest, and its function remains unclear. The plaster floor and basin were founded on a grey make-up layer, (16517).

The northern end of the room was sealed by surface and make-up layer, (16565), which was approximately 20mm thick and 2.0-2.4m square. This may have represented a different phase of use in the space, and as such may have been associated with the later use of the oven.

At the southern end of the room there was a small circular pit, (16566), approximately 0.42m in diameter and 0.2m deep. The fill of this pit was a nondescript yellow-brown silt, (16554); notably however it contained a cluster of animal bones and stone, (16584), containing a small scapula (apparently un-worked). The pit cut patchy surface, (16562) which in turn sealed another patchy surface (16599) lying adjacent to the west side of the oven. This supported a small cluster of irregular stone and plaster objects, (16563) placed prior to the ovens rebuild.

Against the western, truncated, section of the space was grey crumbly silty-clay surface, (16571), which may have been associated with the underlying remnant structure, but was also badly truncated by the western LOE. What precisely this architectural detail was cannot be ascertained, however it was sealed by a thick (c.20-30mm) white marl plaster surface, (16567) which sealed most of the western side of the room. The surviving portion of this relatively formal surface was approximately 2.0m northeast southwest (long) by 0.8m across. This sealed (very) residual internal architecture (17040). This was probably the remains of a platform or bench, however all that was lest was a narrow strip, approximately 0.6m long (northeast-southwest) by 120mm wide and 90mm high.

Cutting the early room surfaces towards the centre and north of the building were a number of hearth features or fire-spots. These proved impossible to sequence in relation to each other (because they were all discrete cuts). Three were identified in total, two of which, (16591) and (16594) were little more than scorched yellow/grey brown ashy silt in very shallow circular scoops, approximately 0.4cm in diameter and less than 100mm deep. The last, (16574), appeared to be little more than a sub-circular (approximately 0.50m diameter) scorched ashy deposit on the underlying surface (17030).

In the northwest corner of the space, was a small square cut (approximately 0.42m across) of unknown function, (17072). The primary fill was a bland marl rich silt, (17066), which almost seemed like a plastering event, except that it contained a rich cluster of obsidian debitage in the southwest corner (17069). This debitage was incredibly dense, clearly laminated or lensed and so concentrated in the corner of the cut (approximately 200mm across) that it would seem to have been placed there deliberately (as opposed to being dumped with the fill). Sealing the lower plaster-like fill, including the cluster, was another brick-like, yellow sandy silt fill (17038). This was almost indistinguishable from the adjacent (eastern) wall of the space, suggesting that the whole thing may have been a deliberate deposition. It is also possible that this hole may at one time have supported a cache of obsidian flakes that were removed and worked nearby.

Primary Oven and Surfaces

Figure 44: Primary oven and hearths in B.75

The primary oven superstructure (17076) was about 1.3m across, abutting the southern wall of the space. Like so much of the building it was clearly truncated when the building fell out of use, standing to only 0.18m high. This primary phase of the oven was filled with a short sequence of four discrete oven floors (17016), (17003), (16597) and (16593), founded upon a layer of make-up, (17025), and interspersed with some collapsed oven superstructure (17002) which may be a sign of repair or a rebuild. The uppermost floor of this 0.1m thick sequence. The northern part of the oven floor sequence appeared to be disturbed or worn throughout by rake-out activity, although the surviving portions of the floors were concentrated to the south of the oven, making it impossible to specifically how this pit related stratigraphically to the oven floors. It remains possible that this pit was related to the early hearth that under-lay the primary oven structure. Possibly related to the early oven was a deposit of ashy make up, (17049), lying immediately outside of the oven, to the west.

A series of patchy make-up and floor deposits lay around the mouth of the oven, which were concentrated at its northwestern end, (16599) and (17012). These were somewhat informal yellow/grey brown sandy silt floors, interspersed with ashy lenses (17018), which may have been associated with rake-out from the oven. These were probably associated with another patchy remnant white marl plaster floor (on a clear grey brown silt make-up layer), which stretched some 3.00m into the centre of the room (approximately 1.10m wide). This surface averaged 20-40mm thick (including their make-up, since the plaster was not more than 2-5mm). At about the same stratigraphic level, running 2.6m (by 0.69m wide) along the northeastern side, into the corner of the room was another surface. This surface sealed the construction cut (also acting as a compression fill) for the eastern wall of the Space 238. It showed no signs of marl plaster, being simple yellow/grey brown sandy silt; however as well as charcoal flecks, it did include occasional plaster flecks, some of which may have been in situ (especially towards the centre of the room).

Figure 45: Young adult inhumation F.2648 in Building 75.

Burials

Lying below the early floor sequence (16599) and (17012), was an infant burial

F.5001. This burial was very badly preserved, with only fragments of the cranium remaining, being almost completely truncated on both sides; to the west by erosion at the edge of the mound/Mellaart's excavation and to the east by a later pit cut, (16556). This burial was probably contiguous with another burial located approximately 1.0m to the north, F.2648. This consisted of the upper two-thirds of a flexed young adult inhumation; the same processes also truncated the western side. Notably this burial contained a single talon from a large raptor (probably an eagle), apparently as a grave good. A third and burial was identified in the space, located immediately to north of the primary oven superstructure, F.5004. The burial contained a crouched neonate, which showed signs of being buried in a basket (phytolyths). The cut for this burial was very shallow and the skeleton showed signs of being crushed, probably as a result of activity around the oven.

Prior to the construction of the oven against the south wall of the building there was some evidence for a small circular cut hearth, (17093), approximately 0.46m in diameter. This was filled with a loose burnt ash deposit, (17091). This fill lay under the primary make-up for the oven floors, making it difficult to ascertain whether this hearth functioned with the primary oven structure, or was a temporary feature during the construction of the building.

Building Construction

The earliest discernable and fully excavated feature directly associated with Building 75 was the construction cut for the walls that bounded Space 328, (17318). This was an L-shaped linear cut, which bounded the southwestern and southeastern limits of the space. The southwestern return was c.2.5m long (up to the truncation on the western side of the space) by up to 0.64m wide and 0.3m deep. The southeastern return was 4.53m long (extending below the northern limit of the space, under the raised space to the north) by c.0.34m wide and c.0.22m deep. Although the southwestern return was fairly level, the southeastern one sloped gently from north to south by approximately 0.2m across its length. This appears to have been respecting the topography of the underlying deposits, which also tended to slope in this way. The walls for the space (F.2624 and F.5005, the southwestern and southeastern walls respectively), were founded inside this cut before the cut was finally backfilled with two fills. The first of these, (17301) in the southeastern return and then by (17088) in the southwestern return. The walls themselves were bonded into one another, making them a single construction event, the brick elements (15776) (in wall F2624) and (17314) (in wall F.5005) were all comprised of firm cemented slightly silty sand, which was pale yellow-brown in colour. The bricks were bonded with cemented pale grey-brown slightly ashy silt, which contained occasional to moderate charcoal flecks, which averaged between 50 and 70mm thick. The walls stood to an average height of 0.4m high from the base of the cut to their final surviving height. This amounted to between 3 and 4 courses (stepping down towards the southern end of the space probably to account for the underlying slope). After the backfilling of the construction cut only 0.2m of the wall stood higher than the internal ground level of the building. The backfill of the construction cuts for these walls, (17088) and (17301), were both mid-grey brown sandy silts, containing brick fragments. The uppermost of these, in the cut for the southern wall, (17088), not only filled the construction cut (17318), but also served to level the southern portion of the room, forming the foundation for the primary oven structure which abutted the south wall of Space 328.

Space 332

Lying immediately to the south of Building 75 was a small room Space 332 defined by wall F.2643 at the east and F.2644 at the south. As with Building 75 this space was truncated at the west and its upper extent also having been removed. It remains unclear whether this space was part of Building 75. That it is perhaps suggested by its shared use of the south wall of Building 75. Despite the truncated height of the south and east walls of the space, these appeared to have been rebuilt or added too given the differing mud bricks recognised in its upper build. Contained within the walls of this space was roomfill deposit (16239) this containing mini clay ball cluster (16240) situated within the south east corner of this space. The rough surfaces in this room (16523, 16572) yielded a number of unusual finds including mini clay balls, bone points, broken axe heads, and a bone toggle. Also found in these deposits was a large spread of apparently in situ obsidian debitage (16536, 16583), suggesting obsidian working. Two other surfaces or make ups were removed from this space

(16588) and (17001). Apart from the walls defining the space there were no notable architectural features in this space.

Open Area

This area is defined by spaces 329 and 333 that respectively contained a large oven and a hearth. These features may relate to open communal areas. Two phases of oven have now been identified the later oven having 6 floors the lower larger oven just 2. Given the lack of modification on the hearth this may have been relatively short lived. Both the ovens and hearth had related surfaces or floors.

Space 329

In last years archive report it was stated that there was a degree of time that separated the construction of Buildings 65 and 68, the later earlier than the former. While this till holds true, the time that elapsed may not have been so great as stipulated in last years report. Here it was suggested that a series of pits separated the two events, these later used as midden dumps. It would now appear that both buildings post date the excavation of the pit sequence. The confusion arose from partial excavation of a series of dump/levelling deposits excavated to the east of the exaction area. The pits as with Building 75 (and the deposits within Spaces 332 and 333) appear to have been truncated, the upper extents of the areas effectively removed (this truncation episode given the number (16224)). The continued excavation of the area to the east of Building 75 suggested this may have been an 'outside' or open area lying without buildings possibly even a yard area. This was indicated in last years' excavation by the presence of numerous fire spots and small fire pits. Continued excavation of this area this year revealed more fire spots/pits these (16236), (16242), (16243), (16252), and (16257) these lying above levelling deposit (16238), that in turn sealed a large hearth F.2640. (Figure 46) The hearth was oval in shape with a moulded raised rim, the inner surface (measuring 1.14m by 0.98m) burnt with use. Two burnt surfaces were associated with the hearth as were eroded plaster surfaces (16535), (16541) and (16550). The open area was bounded on the west by the east wall of Building 75 and wall F.2625 which ran south from its southern corner. At the south wall meet a series of mudbrick walls (16586), F.2641, F.5006 and F.5007 which effectively formed a southern retention for a series of levelling deposits (16451), (17048), (17068), (17077), (17098) and (17302). The upper extent of these levelling deposits would appear to have been utilised as open area surfaces as indicated by the presence of the fire spots/pits and occasional ash dumps such as (16237) and (16278).

Figure 46: Large 'externally' located hearth F.2640 in Space 329

Space 333

Lying above the upper oven was a series of levelling dumps/surfaces, these in sequence (15791), (16201), (16248), (16249), (16267), (16288), (16289) and (17335). Between these levelling events were a series of fire spots and fire pits, (16231), (16283), (16266) and (16286).

Oven Sequence

These deposits sealed a large oven F.2639. The oven, with its mouth to the south appeared to be inserted into a space delineated by walls F.5002, F.2644 and F.2625, respectively at the west, north and east. This upper oven reused the north and western walls of the earlier oven F.5000. Six oven floor surfaces were excavated from within the oven walls suggesting some degree of longevity within its use. Externally several surfaces may have been associated with this use sequence (16514), (16515), (16518), (16537), (16545), (16546) and (16548). Oven F.2639 directly replaced oven F.5000 although their sequences were separated by levelling dump (16549/116272). The earlier oven was larger in size its internal floor measuring 1.49m by 1.44m although it also had its mouth at the south in its later phase. The alignment of the mouth possibly reflected the construction of wall F. 5002 as the earlier oven phase had its mouth at the west. The construction of the wall cut the associated surfaces located outside the ovens mouth, (17089) and (17013).

Figure 47: Two phases of large ovens, inner F.2639, outer F.5000 in Space 333

Levelling Activity

Prior to the use of the oven a series of levelling deposits/surfaces were laid (17036), (17041), (17034), (17060), (17067) and (17303) including pit (17056) and fire spot (17061). These deposits lay against the revetting wall defining Space 329 and thus were later.

Space 334

Removal of the walls of Space 332 and the revetting walls delineating Spaces 329 and 333 linked deposits across what was still probably an ‘open’ area, this Space 334. That this was still an open area is suggested by a series of fire pits and fire spots (17323), (17326) and (17327)) these situated within a further series of levelling deposits/surfaces (17034), (17036), (17041), (17060), (17067) and (17303). The removal of these deposits delineated the upper walls and the upper backfill deposits of underlying Buildings 79 and 80.

Buildings 79 and 80

Building 79 lies immediately to the east of Building 80, the later seen for many years as standing over 2m high within the section left by Mellaart that until now has defined our western edge of excavation. Lying west of and abutting Building 80 is Mellaart’s building E.VIA.32 and 27, which was cleaned this year. All three buildings appear in part to be heavily burnt. The corner of another possible (as yet unnumbered) building lay to the north of Building 79 while another (rather strangely aligned) wall was seen after the removal of Building 75.

Discussion

Even without further work it would appear that certain patterns within the development of the excavated area are already apparent. It appears that at least two buildings, Buildings 79 and 80, lie immediately below the presently excavated sequence, both of these buildings are burnt. Buildings E.VIA.32 lie to the west of Building 80 and is also burnt, giving three burnt and possibly contemporary structures. Does this represent an area conflagration or individual burning events? Whatever the case the areas occupied by Buildings 79 and 80 are backfilled and in time become what we interpreted as open or possibly ‘communal’ areas, as represented by Spaces 329 and 333. Apart from numerous fires pits these areas also contained two large ovens and a large hearth area and in its later phases was used for pitting/quarrying. Possibly contiguous with the use of these open spaces was the establishment of Building 75 to the north west of the excavated area. Although badly truncated the building may have been extended to the south into Space 332 and possibly to the north where only wall footings survive. Once Building 75 had gone out of use the whole

Figure 48: Outline of burnt buildings B.79 and B.80

area, including the open area appears to have been levelled, prior to the construction of Buildings 65 and 68. Building 68 occupies roughly the same area as it predecessor Building 75, while Building 65 becomes the first in a sequence of successive structures including Buildings 56 and 44.

What this appears to represent, in an admittedly small area of the overall site, are periods of relatively dynamic changes between more stable spatial developments. What causes these changes and whether they represent local or site wide patterns is of particular interest and hopefully future work will be able to give us some answers.

The excavations of the TP (Team Poznań) Area in the 2008 season - Lech Czerniak, Arkadiusz Marciniak

Supervisors: Arkadiusz Marciniak, Lech Czerniak
Assistants:, Arkadiusz Klimowicz, Adriana Badtke, Marek Baranski, Agata Czeszewska, Patrycja Filipowicz, Katarzyna Regulska, Klaudia Sibilska, Tonka Soba, Marta Bartkowiak,

Introduction
The TP (Team Poznań) team made of fourteen archaeologists and other specialists as well as students of Institute of Prehistory, University of Poznań and Department of Archaeology, University of Gdańsk undertook its next excavation season at Çatalhöyük. Work commenced on August 9 and was completed on September 9. This year excavation season had two major objectives: (1) to excavate a complex of late Neolithic structures exposed in 2007 and located in central and western part of the Trench, and (2) to analyse a sequence of deposits in eastern part of the excavated area underneath a thick deposit defined as the 'roof' and exposed in the 2004 season.

As regards the first objective, this year season began by excavating a sequence of floors and make up layers in Spaces 325 & 326 of Building 74, placed in central part of the Trench. Excavations were then carried out in its northern part. A white floor built on a solid and relatively thick make up of small white pebbles was discovered and identified as belonging to the oldest dwelling structure in TP Area and recorded as Building 81. The building has c. 54 m2 in its preserved form. A large section of its eastern part, which comprised a long rectangular platform, was truncated in relation to the construction of the tomb recorded as Space 327. As a result, only northern and southern parts of the platform were preserved. Two major features associated with the floor were identified. A large rectangular oven was recorded in the southern part of the Building while a solid c. 6 cm thick rectangular layer, probably some kind of platform, was placed in its central part.

The team completed also excavation of a sequence of deposits in Space 327. The Space was recognized at the end of the last year excavations as containing the incised panel with spiral motifs on its southern, western and northern walls. It was preliminarily defined as a burial chamber. Work conducted in this season fully corroborated this interpretation. Remains of at least nine individuals were recorded and fully excavated. A foundation deposit in the form of a cluster of animal bones was deposited c. 20 cm underneath the burial chamber floor.

A solid and compact occupation layer (the 'roof') as well as thick midden layers directly underneath were taken out. They were placed on the floor of Space 346. The Space was c. 7 m long and 2 m wide. A number of features, mainly bins and ovens, was identified against the Space eastern wall. Furthermore, two platforms were also recorded, one placed against the northern wall while the other in SW corner of the Space. Two large feasting deposits were also discovered, probably in relation to post abandonment activities.

Building 74
The team completed excavating Building 74 composed of Space 325 and 326 (see 2007 Archive Report). The Building was placed directly underneath B. 72 in central part of the Trench.

A partition wall between Space 325 & 326 was made of a number of elements indicating a complex history of its construction. The oldest element comprised a solid mudbrick wall preserved in its northern section (17613 & 17614). Its southern part was probably later truncated making a doorway between these two spaces. This opening was then intentionally built over to seal off the Space 325 when it went out of use. It is indicated by a vertically placed mortar (17610) aimed at attaching the newly built wall fragment (15298 & 17612) to the southern wall of Space 325 & 326 (15225 & 13029).

The floor of both Spaces in B.74 was a solid construction made of fine surface and sequence of make up layers. The floor surface was made of nicely plastered silty sand (15809 – W part, 15807 – E part). No replastering was detectable. The make up in both rooms was very solid and made of layer of white small pebbles lying on stony silt layer. Floors of both spaces were constructed on ashy black midden.

Figure 55: Building 74, Space 325. Floor under internal buttress. Photo TP Team

An interesting feature in both spaces are buttresses placed against longer (southern and northern) walls of both Spaces and put up on their floors (15807 & 15809) (Figure 55). They are arguably some kind of constructional elements associated with roofing of both spaces. It appears that they were set up to hold beams placed against both walls which themselves were set up to hold transverse beams holding the roof. In any case, these new constructional elements mark a considerable shift in the house construction and anticipate further development of this kind of construction well reported at the early Chalcolithic settlements, e.g. at Can Hasan and Çatalhöyük West.

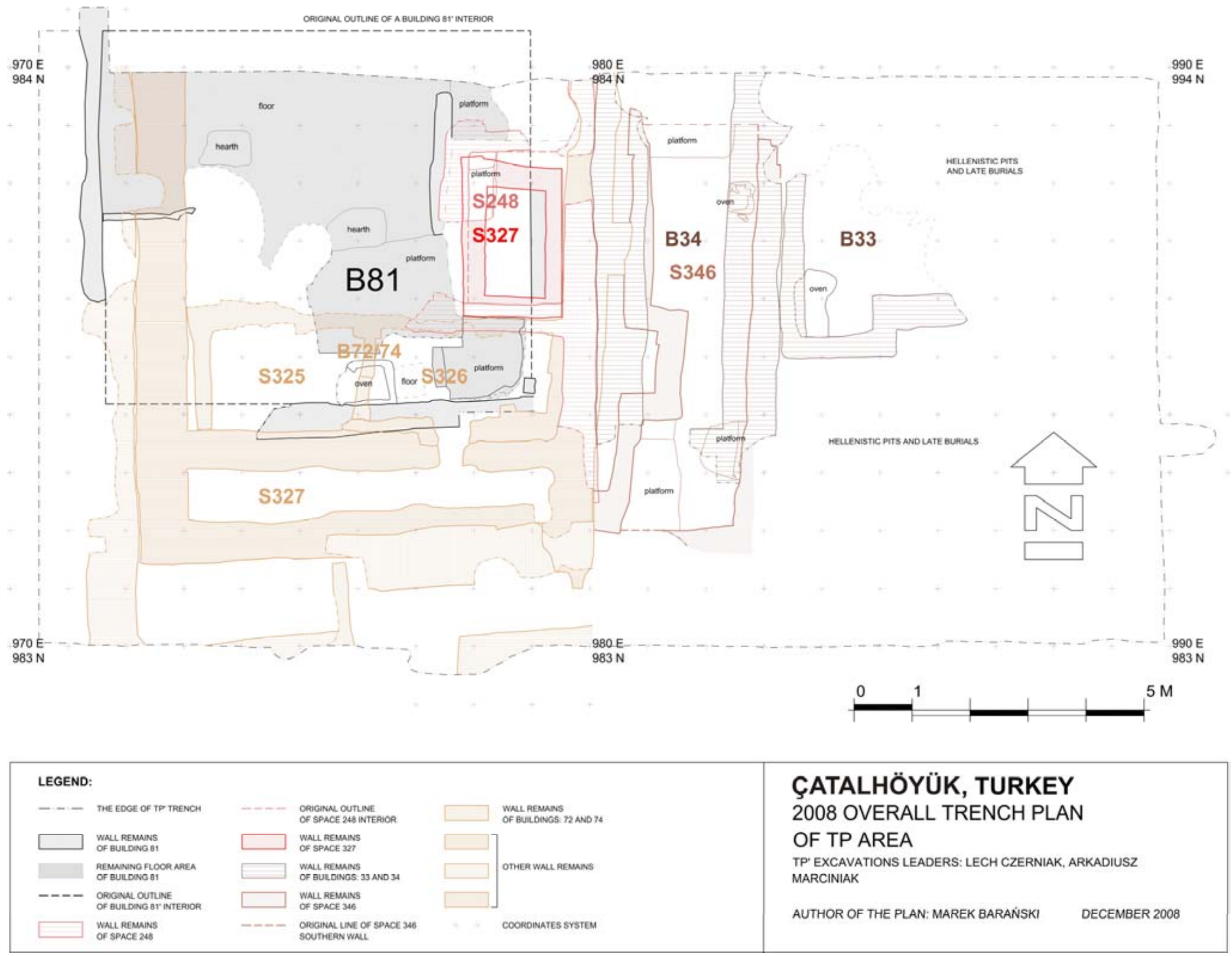

Figure 54: TP Area. General plan in the 2008 season. Plan Marek Baranski

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Figure 55: Building 74, Space 325. Floor under internal buttress. Photo TP Team

Depositional Sequence Underneath Building 73

The works also continued in the northern part of the Trench. A sequence of deposits underneath the floor surface of Building 73, excavated in 2007, was taken out. A solid compact infill layer (13532) was placed directly underneath the floor of Building 73. It was c. 45-50 cm deep and was composed of large number of constructional materials and mixed clay. Its NW part was made from a large number of organic material such as ash and charcoal, which made it looked more like a midden. In addition, it contained a huge number of large fragments of animal bones, mainly cattle and horse, in addition to numerous fragments of fine ware of sophisticated forms, including exotic shapes. A fragment of small figurine ('fat lady') was also found in this layer. The lower level of the layer was divided into western (17603) and eastern part (17600) and it was placed directly on the floor of Building 81 (see below).

The entire sequence of infill deposits was later truncated by a huge cut, which was then filled in by a solid midden rich in different kind of organic and inorganic materials. This cut additionally truncated NW edge of the floor of Building 81 and was particularly deep in its western part.

The midden was composed of two layers. Analysis of stratigraphic relations reveals that its lower part (17630, 17637) was clearly placed underneath walls of B.74 and a sequence of walls in the western part of our Trench. In particular, western room of B.74 (Space 325) and its N-S walls (12230, 15529) was constructed directly on top of the midden. This implies that this midden was deposited after abandonment of B.81 but before construction of B.74. Its upper layer (15847), however, was placed against the N wall of Space 325, which means it was later than the wall construction itself.

Space 327

The work in the 2008 season continued also in tomb decorated by incised panel and recorded as Space 327 (see 2007 Archive Report). Space 327 is c. 2.8 m long and c. 0.9 m wide. Its longer wall is made of seven courses of bricks of considerably standardized size while its shorter wall is made of only five courses. A majority of bricks has dimension 68 x 7 x 8 cm and are made of yellow clay of high quality. Altogether 8-9 individuals were buried in the Space (15838, 17622, 17623, 17624, 17625, 17626, 17807, 17823, 17698, 17699) (Figure 56). They were mostly placed in its northern part. Most of them were clearly articulated. All individuals were deliberately interred in the burial pit at three levels. The lowest level contained mainly disarticulated fragments of bones.

Figure 56: Space 327, Human burials in northern part of Space. Photo TP Team

They may have belonged to individuals deposited above. Interestingly, a headless female skeleton with symptoms of osteoporosis was found at the third level. In general, one child skeleton was discovered in addition to fragments of three other child skeletons. Individual bones were recorded as subsequent numbers in (15839). A large number (>30) x-finds such as figurines, obsidian & flint tools or beads (Figure 57) was recorded in the tomb chamber. The space had some kind of floor, which however was not particularly distinct.

Around 20 cm below the space floor, the western wall of B.81 was recorded. At the same level, a cluster of animal and human bones was also found. It was pretty small and contained fragments of c. three cattle horn corns in addition to individual animal and human bones (Figure 58). The cluster was placed in the very centre of Space 327. This location along with composition of the bones may imply some kind of foundation deposit. A similar deposit was registered underneath the entrance to Space 248 that was placed directly above Space 327 (see 2005 Archive Report).

Figure 57: (left) Female figurine.Photo Jason Quinlan & (right) painted figure on a wall fragment. Space 327. Photo TP Team

Stratigraphic analysis implies that Space 327 is much younger than B.81 and is probably to be associated with the use of B.61 and/or B.62.

Walls In Central Part Of The Trench

Our work also concentrated on a sequence of N-S walls in central part of the Trench between B. 74, 73 and Space 327 to the west and Space 346 to the east. This sequence used to divide TP Area into the main Trench to the east and the so-called extension Trench to the west that we started digging in the years 2003-2004. The most upper structure in this sequence comprised long wall consisting of a number of constructional elements. The upper part of this wall (7808) belonging to B.34 was excavated on 2003 & 2004. It is currently c. 20 cm high and is made of two courses of bricks. Its lower part was composed of two parallel rows of relatively small bricks (12274, 17680 & 17681). The space between these two rows was filled in with pretty homogeneous silty clay (possibly material otherwise used for bricks manufacture). Three pilasters (buttresses) from the eastern side of the wall (7809, 17676) comprised its integral part (Figure 59). They were interwoven within one of the lowest courses of the bricks. There is no doubt that this course and all pilasters belonged to the Building placed directly underneath B. 34 as they were located right under its western wall.

Figure 58: Space 327, foundation deposit. Photo TP Team

Figure 59: Wall 7809 & 17676 with pilasters. Photo TP Team

The wall with buttresses probably comprised western wall of older building that may have been completely destroyed by later activities. If this is the case, we encounter yet another example of construction with internal buttresses indicative of early Chalcolithic tradition (e.g. Can Hasan, Çatalhöyük West). Alternatively, they might have been external buttresses set to support the eastern wall of the building endangered from being collapsed. It is worth stressing that these buttresses are later addition to the wall, which seems to support the latter hypothesis. If this is the case, the building with this wall was probably placed to the east from the wall. However, no traces of it are discernible in terms of floors or any other constructional elements (this applies to both areas to the east and to the west from the wall). However, we cannot rule out a possibility that there were no solid floors at the end of the mound occupation.

The 'Roof' Sequence and Space 346

A second major objective of this year excavation season was to dig a sequence of deposits east of a range of walls in central part of the Trench that comprised the eastern walls of Space 248, 320, 327 as well as the eastern walls of B.74 (Space 326) and B.72 (Space 324).

Figure 60: Walls 7689-17693 with alcove. Photo TP Team

This part of the Trench was excavated in the years 2001-2004. A major discovery of the 2003 season was a solid and thick layer of plaster defined as a 'roof'. It was placed diagonally sloping to the east, probably as a result of some kind of post depositional processes (see 2003 & 2004 Archive Reports).

The work this year began by redefining a sequence of layers between the 'roof' and centrally placed N-S walls. An original sequence of layers was redefined in the following way: a sequence of midden layers placed diagonally (at the same angle as the 'roof') (7841, 7842, 7843 and 7844) were treated as one and excavated as unit 7841. This newly differentiated deposit is younger than solid infill layer directly to the west.

This space is located directly to the East of long walls following N-S alignment and made of yellowish mudbricks. Its upper part was a continuous wall, which subsequent elements were given separate unit numbers (17689, 17690, 17691, 17692, 17693). This wall had a kind of alcove in its central part of difficult to define function (Figure 60). Dimensions of inner part of the alcove were 1.15 m x 0.65 m. This wall was probably rebuilt at least twice as seen in its western section. The entire space between the walls of the alcove was filled in by horizontally and vertically placed bricks. Interestingly, bricks in the alcove seem to be somehow constructionally related to the lower section of the wall itself (17824). In any case, we are almost certain that this pile of bricks was actually older than the bricks surrounding it and making the alcove, at least in the last phase of the wall. This older wall (17824) is made of finely made black bricks, especially distinct in its central and northern part. This kind of bricks has not been encountered in the TP area to date.

Space 346 is placed between the walls (17689-17693) from the west, the wall (17825) from the east, and the wall (17826) from the south. The northern wall is located beyond the excavated area but it seems to be placed very close from the north section of the Trench. The room was pretty long as it was c. 7 m in length and c. 2 m in width. Since the space is clearly delimited from the west by this solid wall (17689-17693 & 17824), its functional relations with adjacent Space 327, B.74 and B.81 remain unclear. As regards stratigraphy, Space 346 is certainly older than destruction of the east wall of Space 327. A fragment of incised brick probably originating from the north wall of Space 327 was dumped into the infill above northern part of the floor of Space 346.

This longitudinal space has numerous in-built features associated with its use. As seen from the north, there is a rectangular platform (17818) that appears to be sitting against the space northern wall. Its dimensions within the Trench are 130 cm x 58 cm. The platform abuts the lower part of the wall (17824). Alternatively, this construction may have been a kind of basin. This hypothesis seems to be supported by presence of a kind of white/yellowish wall from the east side. It is c. 20 cm wide and it may have made its south wall. However, the corresponding western and eastern walls are hardly discernible.

Another feature on the floor of Space 346 comprised rectangular bin (17816) placed against its east wall (17825). The bin is a pretty solid construction made of clearly distinguishable walls of white silt and up to 6 cm wide. Its outer dimension was 54 x 41 cm. The construction appears to have been covered by some kind of lid as indicated by a compact fragment of white silty layer in SE corner of the feature. A circular feature (17817), possibly another bin, was placed against the eastern wall of Space 346 in its more central part. It is considerably larger than the bin (17816). It was also made of four walls of white silt, however they were not as well preserved as the walls of bin (17816).

Another in situ feature comprises a posthole (17820) placed against the west wall of space and against the south wall of the alcove. It is oval in shape with dimensions 48 cm x 34 cm. Both, the base of the feature and the northern wall of the alcove is burnt. It was probably burnt during abandonment of the space. Alternatively, this may comprise a bottom part of some kind of destroyed fire installation. Another feature associated with the floor (17819) of Space 346 is an irregular oval pit (17815) placed against its eastern wall (17823). It is 54 cm long and 48 cm wide. Fragments of broken bricks and numerous animal bones were registered on top of this feature.


Figure 61: Space 346, SW platform with adjacent feasting deposit. Photo TP Team.

One of the most substantial features in Space 346 is a large platform (17813) located in its SW corner. It is made of a solid clay layer dark yellow/orangish in colour. A fire installation, probably oven (17821) was placed against eastern wall of the space and the platform (17813). Its size is difficult to estimate as it was badly destroyed by burrowing animals. Its preserved dimensions are 96 cm x 60 cm. Inside the oven walls, there is a lot of clayish material that appears to be very burnt.

Except for these in-built feature, remains of two activities were also recorded on the floor of Space 346. They are possibly associated with abandonment of the space. A cluster of large animal bones, mainly cattle, and large pieces of pottery (17809) was found in SE corner of Space 346 next to the oven (17821). In addition to large pottery fragments, a residual piece of some kind of plastic installation with female breast attached to the brick was also recorded. These are probably remains of feasting (Figure 61). A similar deposit was also found on the northern platform (17818) of Space and around it. This feasting deposit was also composed of a large number of bones. However, they were considerably more fragmented than large pieces in the former deposit (17809).

Building 81
This large construction is the oldest building in TP Area. Its overall size was possible to reconstruct quite reliably and had an area c. 54 m2. The western wall of the Building was 6.8 m long. Its northern wall is located outside the excavated Trench. However, its western edge making NW corner of the building was identified making possible to reconstruct the northern wall. Unfortunately, southern wall was considerably destroyed. Its SW corner is not preserved as it was truncated by large cut that was later filled in by a deep and homogenous midden (see above). Hence, a shape of this part of the building can only be tentatively reconstructed. If this reconstruction is correct, the southern wall was 7.8 m long. Considerably destroyed was also eastern wall of the building. Considering the stratigraphic complexity in this part, identification of this wall was not at all straightforward. It seems that the wall (15856) served as the eastern wall of the building. This wall was originally set to be the eastern wall of 327, and only later it was reused (Figure 62).

The floor of the Building is pretty substantial. It appears to be made in two major sequences. The lower floor is made on a solid and clearly layered silty make up. White floor surface

Figure 62: Building 81 with later midden. Photo TP Team.

replastering of the floor surface (see 17842). However, this observation is tentative as the floor was considerably truncated by later activities and only its small fragment was exposed. The upper floor is made on a very characteristic make up composing of small white pebbles. They were mixed up with brownish clay. The layer was up to 6 cm thick. The floor surface was solid but rather thick and probably was not replastered. In general, the floor was very distinct, generally white in colour but with signs of tramped dirt (Figure 63). This kind of floor has striking similarities to the floor of B.61 some 1.2 m directly above it (see 2006 Archive Report).

Single in-built features were identified and recorded. Some kind of N-S partition wall (17862) placed against the northern wall of the building was found. Alternatively, this may be an edge of the platform, which was later destroyed /truncated. In any case, this partition wall is clearly younger than the floor (17618) with pebble make up as it is sitting on these pebbles. Further to the east from this wall was a white platform (17863). Only their small fragments were preserved. A relationship between the partition wall and the platform is not at all clear. A significant part of the platform was truncated by the large rectangular cut in relation to the construction of much later Space 327 (see above).

Quite mysterious constructional elements were recognized in central part of the floor of B.81 (17845 & 17844). They were close to rectangular in shape. They may have been formed as a result of placing some kind of hot objects that left behind signs of fire cracks. One of them was placed against centrally placed platform/floor (17846) (see below). However, it looks as if the platform, which is related to one of the later episodes of the building reconstruction, was built against possibly then existing object that left this burnt surface behind.

A solid screen wall (17861) was built on the floor perpendicularly to the western wall of the building. The screen wall itself was not preserved and its presence is discernible by a distinct layer of brown bricky material. The area directly south of the wall was then truncated and filled in with substantial midden that is placed in what was the SW corner of B.81 (see above).

The most complicated situation occurred in central-southern part of B.81 where large platform/floor (17846) of unknown function was placed. It was built directly on the floor (17618). It is delimited from the west by a thin screen wall (17847) that is painted in red from the inner side and by similar screen wall (17867) from the south. It is c. 2-3 cm wide and is painted in red on both sides. The platform was sat neatly between these two walls, as described above. It is composed of three layers: white plastered surface, greyish layer, and brownish layer. The entire platform is up to 4-5 cm thick. Its exact size remains unknown as it was certainly truncated by later cut in relation to the construction of much younger Space 327 (see above).

Figure 63: Building 81, a fragment of floor. Photo TP Team

The platform itself was placed on older platform/floor that also is abutting both partition walls (17847, 17867). An exact size of the older structure cannot be recognized as it was only observed in sections. It was not exposed as the younger platform (17846) was not taken out. Both platforms may have had a ceremonial significance as they were sitting between two partition walls that are nicely decorated by red painting.

Directly to the south, exactly between the screen wall (17867) and the building's south wall (17865), there was a rectangular basin that was later used for the construction of oven (15896). This oven is certainly younger than the screen wall (17867). An original function of this basin is difficult to define considering it is not be excavated. This space was later used to built up an elaborated oven. Its solid superstructure was rectangular in shape and it was made of two parallel walls. The outer surface was painted in white (?). The oven base was solidly built and had a smooth outer surface. A pretty substantial layer of ash was found on the oven base.

Particularly complex situation occurred in SE corner of the building. The uppermost element in this part comprised a white and thick platform (17604, 17606, 17615). It was made of substantial and thick make up of white pebbles (similar to the building floor). This platform was placed against some kind of older platform. It had white surface and was also made of make up of white pebbles. The entire layer was c. 2-3 cm deep and was certainly thinner than the platform above. Both platforms were placed on a solid make up of soil and bricky infill up to c. 13-14 cm thick (17871). This layer itself was again sitting on older greyish floor (17870) ca. 2 cm thick. This implies that in this corner we have at least two platforms and one floor underneath, all related to the oldest phase of the building use. Since this part of the building is not to be excavated in the future, more details of this constructional sequence will not be available.

As mentioned above, almost entire eastern part of the Building was deliberately destroyed in relation to the construction of the tomb (Space 327). The latter was built in the place of eastern platform of B.81 and this should be regarded as a deliberate act. Consequently, the entire content of this platform was taken out before the tomb was built. This is further corroborated by the presence of the eastern wall of B.81 (17810) at the bottom of Space 327 (see above).

Summary

This was the last season in TP Area in this phase of the project. The work in the next two years will be aimed at studying all materials excavated in the years 2001-2008.

IST AREA 2008 - Mihriban Özbaşaran, Güneş Duru

Supervisors: Mihriban Özbaşaran, Güneş Duru,
Assistants: Melis Üzdürüm, Turhan Ulgur, Ece Bircek,

The fieldwork

Excavations in the IST Area in the 2008 season were carried out in July. The area was first surveyed and scraped in 2005 and excavated in 2006. It is located south of the South Area (also known as Mellaart Area) on the southwest slope of the mound. The preliminary results had indicated that the southwestern slopes of the mound were settled during Level IV/V (levels, suggested by Pottery and Lithic Labs.; C-14 datings are not yet available). The exposed architectural features had shown that the settlement continued beyond the village road (beyond the present day fence) that runs parallel to Çarşamba river along the west slope of the East Mound. Excavations had revealed a multi-roomed building, Building 63, lying in NW-SE direction, which was surrounded by open spaces.

A platform made up of large mud-bricks was located S of the building. S of the platform revealed the NE corner of another building (Space 253) and an open area (Space 294) W of it that was used as a midden. In the NE corner a third building with only two rooms excavated to date (Spaces 301 and 302) (Özbaşaran- Duru 2006, Figs. 93-97).

Building 63 was a burnt building and it was the most complete found. Others were cut by the village road to the W. Therefore, excavations focused mainly on Building 63 with the aim to understand the building itself and its relations with its surrounding spaces.

The objectives for 2008 excavations were put as the following:

a. continue digging in Building 63 by removing the already exposed floor level of the building to understand its constructional stages, its early phase, the changes between the early and the late phases, the continuity if there is, the possible function of the inner spaces/rooms and features (such as the red-painted plastered platform which was partially exposed in 2006); to understand the reason of the fire that caused the collapse of the building, whether it was accidental or intentional - one of the important concerns at Çatalhöyük and to find out the similarities and/or differences with similar buildings elsewhere on Çatalhöyük East.

b. to dig in the area south of Building 63 where the mud-brick platforms were located, in order to understand the relation of these platforms with the surrounding buildings and obtain data for the interpretation of their functions.

2008 excavations have provided the following data and the discussions:

Building 63 was excavated in 2005 and 2006. The exposed part represents the SW of the building, the NE part is unexcavated. The building consisted of a storage room to the SW (Space 283), a long and narrow side-room to the NW (Space 289), and the main room - the largest among the excavated spaces- (Space 284 south and Space 285 north) E of the excavation area.

Two building phases have so far been excavated in Building 63, temporarily phased as Building Phase I and II (from top to bottom). Building Phase I was excavated in 2005 and 2006, where Phase II was first identified in 2006 but not excavated. It was exposed in 2008 in a limited area, mainly in Space 283, and it is recognised by the S and W wall of Building 63 and was confirmed by the fill and the inner wall that divided the side room, Space 289, from the storage room, Space 283.

Building Phase I also has two phases, named as A and B. While the term “building phase” implies changes in the main walls of the building, A and B indicate additions and/or alterations mainly in the architectural features. IA and IB showed no changes in the general layout of the building, that is, there were no alterations in the main walls of the building but floor renewals- that were accompanied by changes of inner architectural features. Besides, during Building

Phase IA, the floor of the main room (Space 284+285) was renewed three times phased as Building Phase IA1, IA2, IA3.

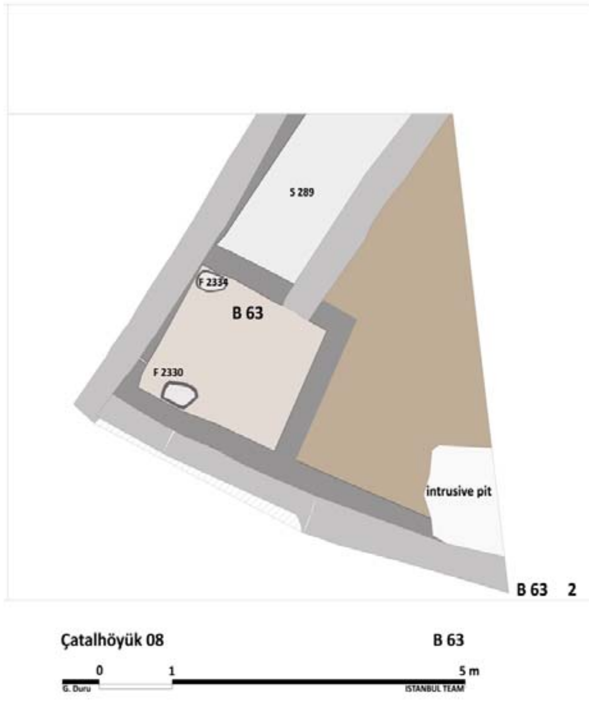

Figure 64: Building Phase II of B.63. Plan Güneş Duru

Starting from the earliest; Building Phase II (Figure 64) was known from the W and S wall of the building and excavated mainly in Space 283. Excavations conducted outside and inside Space 283 have exposed these S and W walls of the early phase of Building 63. Removal of an external additional wall of the late phase, F.1968, W of the W wall of Building 63, had exposed the west facade of the main building wall (F.1957). An obvious difference in the wall construction (see Figure 65) indicated two phases. This early phase was also identified by the S wall of the building: A mud brick wall (F.2317) was excavated under the late phase's bins. It was extended towards the E in Space 284. It was quite well preserved when compared to the S wall of the late phase (IA and IB). The late S wall had been found partial and disturbed by late activities - probably Late Roman pit disturbance in the area (cf. Özbaşaran - Duru, 2006).

Figure 65: The outer face of the W wall of B.63 showing two different constructional phases. Photo IST Team

The third wall that confirmed the early phase was exposed between Space 289 and 283. It separated the two rooms from each other but which would change in the late phase and provide access between rooms. The early phase was also documented in the fill of Space 283; it was heavily burnt and consisted of collapsed mud-bricks. In the SW corner of the room a badly destroyed bin was found (F.2330). There was also a concentration of charcoal pieces that at first sight implied the possibility of a wooden cup, however further excavations showed that it could be a wooden support or a footing next to the bin, or the bin was set on a wooden platform (?). Traces of an earthen kerb implied the location of another bin on the NW corner of the room. Only a single wall/kerb survived of this bin, the rest destroyed, possibly during the fire and the collapse of the room. A layer of seeds found therefore could belong either to the content of the bin or to a scatter during the destruction. No clear floor was found in the space.

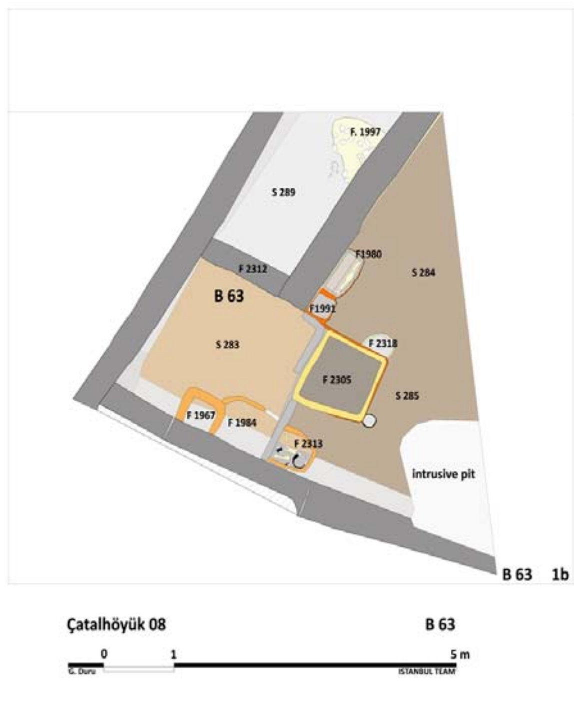

Figure 66: Building Phase Ib of B.63. Plan Güneş Duru

Building Phase I B (Figure 66) was similar in plan with a new wall construction to the S and the renewal of the W wall on the top of the old one. The south wall of the building was re-made with a wall-thick addition to the south that resulted in a change in size of Spaces 283 and 284, and therefore the building. The organisation of the rooms were retained. Space 283 was the storage room, Sp. 289 the side room and Sp. 284 and Sp. 285 formed the main room.

In Space 283, two bins were constructed against the S wall (F.1967 and F.1984), and there may have been a third one in the SE corner. The E wall of the room was renewed, but it was more like a screen wall than a usual wall.

Space 289 had a thick plastered floor, whitish/greenish in colour, and it had an inclination towards the south. The access between Sp.289 and the storage room was via a threshold at floor level. On the NE corner of the floor, was a triangular area at a higher elevation than the floor (thus interpreted as a platform during excavations) exposed a group of natural rocks and ground stones as a cluster (13932). Traces of a probable mat (?) over and under some of the stones inspired to analyse the cluster as a priority. Investigations showed that the traces were the rest of a basket. Some stones were inside the basket and there were a few under which may have bounced out of the basket during the destruction of the house. Another interesting find in the same space and of the season were two neonate burials. They were the first skeletons found in the IST Area. Both were dug below the floor level of Space 289, (13985) was the earlier burial and (13969) the later. Both were poorly preserved, the early being disturbed probably by the late interment. Both were close to the east wall of the room, buried in a N-S direction. They were excavated and studied by Dr. B. Boz (Hager, L. – B. Boz, 2008).

Spaces 284+285 lay to the north and south respectively (Figure 67), representing the main living room of the building. It had a well-preserved mud plastered floor. As the west wall of the space - which is a screen wall made of small mudbrick blocks - the main room seems to be related to the storage room 283. While the southern part of the screen wall was left unplastered, the northern half (the top and its E face) was elaborately plastered and painted red- similar to the E side of the platform. The platform, square in plan, well plastered and red painted, leans towards the screen wall. It had alterations during the use of the space. It was probably built as a platform, but then used as a fire installation and renewed twice (finally plastered again and used as a platform in the late phase, IA). Another feature was a scoop, preserved only as semi circular trace, it was placed just north of the kerb of the platform, and plastered with white clay. During the renewal of the floor the scoop went out of use, levelled and covered by the floor plaster.

Figure 67: Space 284 in front and 283 at back, B.63. Photo IST Team

On the outer SE corner edge of the platform was a hole-mouth jar with dark coloured surface and well burnished. It was set within the floor such that its mouth was on the same level with the floor of the space.

A pillar (F.1991) leaning against the E face of the W wall of Space 285 and the clay box (F.1980) with a cattle skull (Özbaşaran - Duru, 2006) were placed in this early floor level of the building, renewed and continued to be used during the late floor phase of the space. The pillar was also plastered and painted red but the paint was partially and very poorly preserved.

Basin F.2313 in the SW corner of Space 284 was another interesting feature of the room. It was a quadrangular, shallow basin with a pot laid on its side (Figure 68). There were also scattered sherds and a cluster of two cattle scapulae - one from a mature animal and one from a young (U. 13937). They were clearly placed in the bin. The pot was broken. It had a dense black residue (?) inside (cf. Yalman et al. 2008). At first sight it seemed that it was burnt however the black traces were to one side of the pot; the bones were not burnt either, therefore it was the material (probably burnt, that was put in the pot that gave the dark colour.

Figure 68: Basin F.2313 on the SW corner of B.63, Phase Ib. Photo IST Team

During Building Phase IA (Figure 69) the three rooms of the building continued in use with the renewal of floors and additions of new features and changes in the function of some of the features. The floor of Space 289 was renewed and a basin was added to its SE corner (Özbaşaran- Duru 2006). Space 283 kept the same function with the same bins being used. The W bin F.1967 was full of carbonised barley whereas the E bin (F.1998) was empty. The floor of Space 283 was not properly plastered but it was possible to identify by the features of the room and the collapsed finds exposed at a certain elevation. This was the level where finds such as the female figurine depicted as live on the front and dead on the back, an elaborately worked mace head and the odd, horn-shaped ground stone were found (see Özbaşaran- Duru 2005).

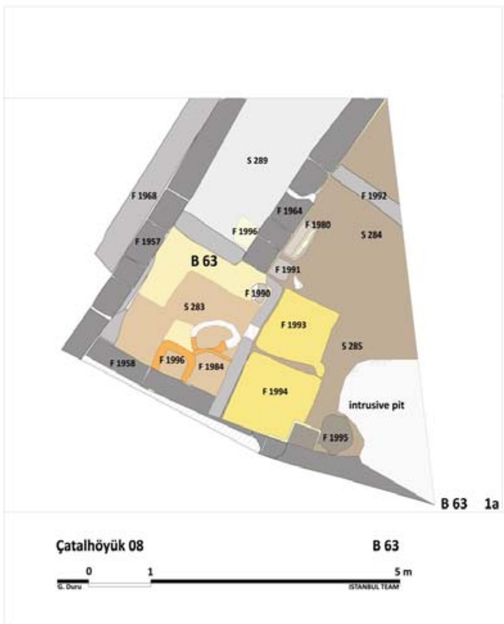

Figure 69: Building Phase Ia of B.63. Plan Güneş Duru

In the main room (Space 284 and 285), renewals were made on the floors, additions were made to a kerb F.1992 (north of Space 285), and a fire installation (F.1995, S of Space 284). The floors were renewed three times, IA1, 2, 3. The SW corner of a probable burnt clay box (F.2322) (the majority of this extended beyond the limit of excavation and therefore not shown on plan) was laid in the middle of the space. The floor around this feature had tiny white pebbles – appearing to have been placed deliberately against the fire. A shallow kerb was added to the N of Space 285 where the excavated area was only a tiny triangular area (see Özbaşaran- Duru 2006, Fig. 94). In Space 284, a platform was constructed to the SW corner (F.1994), on top of the basin of the early phase (F.2313). Feature F.1993+ F.2305 was modified into a platform. Clay box F.1980 was retained on the W wall of Space 285 and continued to be used with the same function.

To conclude, excavations have shown that the building was burnt by a fire, which started possibly in the storage room, Sp. 283 in its early phase. It caused the renewal of the building where the household preferred to use the spaces in a similar way but with a change to the S wall. They had built the S wall of the building a little towards the S. The change in the size of the space and therefore the building is so small that the reason should have been something other than the enlargement of the space. It could be a simple technical reason – to use the old wall as foundation for a better /stronger construction – that they had built the new S wall on directly on top of the old one – which was the case in the W wall- but a little more to south. The building was again destroyed by a fire in the late phase (Ph. II A) where the fill of this phase was full of fragmentary roof constructions and burnt wall and floor fragments and even a complete collapsed down wall. Thus two phases of the building were destroyed by fire which suggests the possibility of an intentional fire. If this is the case both appear to have started in the same space, the storage room which was full of archaeobotanical remains (Ergun 2008).

Platforms

South of Building 63, an area, paved with large mudbrick blocks, was located (Figure 70). Mud bricks used in this area were generally mde up of a silty clay. Macroscopically they had little temper. The mortar, on the other hand, was tempered with tiny charcoal and animal bone fragments and a few obsidian. Of note was the brick size and the placment of the bricks. The bricks measured in average 0.4 x 0.8 m and were placed in alternate courses of headers and stretchers. The difference in texture, size and construction implied that they were deliberately made for a special need/function – in relation to the mud bricks of the walls of buildings. The inclination of the area they were placed confirmed this characterization. The area should have been levelled by these mud-bricks that were placed on an even plane, regular with even spaces for constructions. They were placed parallel to the main exterior walls of the buildings, eg. along the south wall of Building 63; the north wall of Space 253; as an extension of the east wall of Space 253. Their position implies that they functioned as support walls at ground as vertically placed paving should function as reinforcement to the walls and the area. If we consider that the IST Area is located at the edge of the main settlement, on the slope and close to the Çarşamba river, it could be possible that these platforms acted as foundations to protect the mud-brick walls against the slope, the erosion and the moisture.

Figure 70: left Wide kerpiç walls and the platform, S of B.63, right platform from NE. Photo IST Team

Another interpretation for this vertically placed platform between the external supporting walls, its width, flat surface and massive character tempted us to think of an additional/secondary function for the platform. It was exposed at a lower elevation than the walls of the buildings. This characteristic led us think that it could have provided an alternate elevation to reach the roof level of the buildings around. Keeping in mind that the roof levels functioned as the main living spaces for Çatal people, it could have produced some new and stronger means to reach the floor level other than wooden ladders on such a slope.

Concluding Remarks

Our excavation work at Çatalhöyük came to an end in 2008 season. This has several reasons. One of them is; we came to an understanding that we are not going to be able to excavate the early levels of the settlement. Our research questions and approach shaped around the issues of emergence of the first agricultural societies and during that process how the needs and the ideological transformations took place. These research questions and approaches derives from our team's 20 year old work experience at Central Anatolia and Cappadocia region which currently continues.

Our main interest areas are the relationships, contrasts, intersecting fields of the early agricultural societies like Aşıklı Höyük, Musular and Çatalhöyük and the relationship between Cappadocia and Konya Plain region. While we started the Çatalhöyük excavations with that kind of holistic approach, the southwest slope that we called "Ist Area" was chosen as a potential area which we could reach the early levels. However, the fact that even the slope of hill being occupied by the houses that belong to later levels caused an obstruction to reach our aim. Nevertheless, in a very limited area the existence of those early levels were proven (Farid 1999), but the extensive excavations that would give us information on the life styles and the characteristics of the settlement could not take place.

Despite that, our fieldwork contributed to the versatile and extensive research at Çatalhöyük.

- East Çatalhöyük settlement is extending beyond, at the southwest, beyond the known border to the west of the fence and the village road.

- Southwest of the mound is occupied by the slope structures which are later than Level V.

- These structures are externally supported by large mudbrick blocks. These walls looking large mudbrick support blocks that are binding different buildings to each other have not seen anywhere else on site before. This picture led us think that those mudbrick blocks might be serving two different purposes: protecting the architectural structures from the humidity that is caused by the seasonal flooding of Çarşamba river; preventing the sliding of slope structures.

• So-called structural elements which look like a large mudbrick wall that has turned into a large platform through time, possibly used as a platform to reach the roof terraces.

• Two phases of the Building 63 have been excavated, both phases of the structure found to be burned down. This is an important case in terms of the heated discussions that are going on at present regarding whether or not structures are burned down intentionally or accidentally. (Twiss et al. 2008).

• Although, Building 63 is carrying the characteristics of a Çatalhöyük house with its general plan, it is unique in terms of its internal structures and findings. From that perspective, in this "typical Çatalhöyük house", an unusual figurine was found. The clay figurine that is shaped as a pregnant woman in the front, is carved as a skeleton at the back which should be an outcome of a perception that puts the life and death together.

• The participation of our team members to the laboratory work on a specialist level happened only at the lithics lab. Nurcan Kayacan has been working on the Neolithic period obsidian technology, specifically on the technological analysis for sourcing. Subjects such as sourcing as well as the technological and typological lithic production according to the raw material has been studied for the first time at Çatalhöyük at the lithics lab run by T. Carter and Kayacan's experience on this allowed Eastern Anatolian obsidian to be defined at Çatalhöyük. Likewise, Kayacan's macroscopic observations are justified with chemical analysis (Carter et al. 2008) and in this way new agenda is added to the ongoing research.

The preliminary results/interpretations that are mentioned above will be studied in detail for the coming publication and also they are the subjects that are going to be discussed with Çatalhöyük specialists.

For every member of our team, Çatalhöyük has given incredible opportunities in terms of working in the site, meeting with large number of specialists, and discussions, but most importantly working with Ian Hodder's perspective has been a big experience and happiness for us; special thanks to him. Moreover, our thanks also go to our team members, and wishing them a very successful future.

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WEST MOUND EXCAVATIONS

Trench 5 & Trench 7 – Peter Biehl, Eva Rosenstock with contributions from Ingmar Franz Chris Doherty & Philippa Ryan

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Abstract
In this year's four-week field season we continued to work in Trench 5. In collaboration with the Selçuk team, several late disturbances and one late Roman/Byzantine burial were excavated and documented. Further excavation of the Early Chalcolithic (EC) architecture this year enabled us to define several spaces belonging to a number of buildings. The exact definition of the buildings requires future extension of the Trench towards the S and the E, but it is already clear that, as hypothesized after the 2007 campaign (Biehl/Rosenstock 2007), the architectural pattern closely resembles that of Can Hasan I 2B (French 1998). In Trench 7 we extended the deep sounding another 30 cm deep to document the different layers of natural. Since we were able to construct a tent this year we re-documented the stratigraphy in the deep sounding. And finally, we laid a grid between Tr 7 and the W-edge of the East Mound for a future project consisting of coring and test pits.

The Teams
Work on the prehistoric remains were carried out by the Buffalo-Berlin team directed by Peter F. Biehl and Eva Rosenstock with students from the Universities of Buffalo, Berlin, Bristol, Cambridge, Freiburg, Halle and Paris. The late burials were excavated and documented by the Selçuk Üniversitesi team directed by Asuman Baldıran and Zafer Korkmaz (see SEL report).

The Excavation
In this year's four-week field season on the West Mound we continued to work in Trench 5 (Figure 71). In collaboration with the Selçuk team, several late disturbances and one late Roman/Byzantine burial were excavated and documented. Further excavation of the Early Chalcolithic (EC) architecture this year enabled us to define several spaces belonging to a number of buildings. In Trench 7 (see Figure 77 & 78) we dug down another 30 cm in the deep sounding and finished documenting the stratigraphy. The main objective for Trench 5 was to excavate and understand the spatial relationship of the EC architecture, whereas the main objective for Trench 7 was to establish the stratigraphy of the West Mound with a deep sounding in order to better understand the transition from the East to the West Mound during the Late Neolithic and Early Chalcolithic and also the development and end of the Early Chalcolithic on the West Mound.

Early Chalcolithic Settlement
Trench 5
Further excavation between walls F.2424 and the S and W profiles of the trench revealed after removal of the late grave F.2420 (see SEL archive report and Biehl/Rosenstock 2007, Fig. 82) a space defined by the single-mudbrick walls F.2424 and F.5051 (Figure 71). The two walls bind into each other and show internal buttresses, F.5063 and F.5061. While the lower courses of these walls consist of compact grey mudbricks and white compact mortar, very loose grey ashy material forms the uppermost preserved course of mudbricks. This might be just our last glimpse into a second phase in wall construction, but the plaster (17201)

Figure 71 Excavation Ground Plan of Trench 5. Plan Frank Stremke.

covering F.2424, F.5051 and F.5063 overlies both kinds of mudbricks. A third buttress F.5062 was partly uncovered close to the W profile, thus showing us that the W wall of this Space 342 (Figure 72) is to expected only a few more cm towards the W. The fill in Space 342 (16896) consisted of chunks of brown mudbrickish material and white chalky lumps with frequent occurrences of elongated phytoliths. Finds, such as large EC I potsherds, large fragments of animal bones as well as small finds (e.g. a worked horn core (16896.X5) concentrate along the walls of the space. During the removal of the late grave F.2420 (see SEL report) which cuts into walls F.2424 and the roomfill of Space 342, ribs, vertebrae and upper limb bones of an infant skeleton (16835) were found close to wall F.5051. The complete skull in the W, finger bones as well as some vertebrae and the pelvis in the E could subsequently be exposed in situ (Figure 73). The spine of the neonate abutted plaster (17201) on wall F.5051, and neither a grave cut nor any kind of container remains could be detected. The skeleton thus seems, like the other finds, to be part of the roomfill, as no association to any kind of surface or installation exists. Since fingers were found located close to the maxilla of the infant and the spine and pelvis indicate a position lying on the right side of the body, a contracted crouched position with the head in the W can be deduced. The limbs were most likely cut away by the late grave F.2420, because the pelvis and thus the lower limbs rested at a considerably higher level than the skull and thus the upper body of the neonate.

Figure: 72 Overview photo of Trench 5. Photo West Tr 5-7 Team

Space 310 defined in 2007 by the double walls F.5058, F.2408 and Space 2427 (all made of grey mudbricks and white mortar, Figure 74) and the S profile was further excavated in 2008. In the light of the finds of buttresses in Space 342 as well as between Spaces 340 and Spaces 341 (see below), our initial assumption of a S doorway into the space (Biehl/Rosenstock 2007, 126) might have to be revised though only an S extension of the Trench in 2009 can prove whether there is an entrance to the space or two buttresses. On the walls Space 310 we could distinguish two layers of white wall plaster (13726 and 17249) - the lower layer showed traces of red paint (Figure 75). The roomfill (16898, 17214) had similar disintegrated lumps of mudbrick and plastery chunks mixed with occasional phytoliths as in Space 342 and revealed a considerable amount of small finds as well large fragments of potsherds (e.g. a vessel broken in two halves (Figure 82, see also below report Franz) and complete vessels such as 17214 X8. Moreover, pieces of unburnt pottery as well as a lump of red pigment (Figure 87 - see below report Franz) might hint to activities carried out in this area. Many potsherds stuck almost vertically in the roomfill and, together with the small finds, clustered along the walls of the space. A similar Space 345 is located E of Space 310. While its S and E boundaries remain hidden under the Trench edges, the double walls F.5068 and F.5067 form its W and N boundary. Its walls of grey bricks and white mortar and its roomfill are heavily disturbed by the late grave F.2419 and an underlying late pit (16831/16832) (see SEL report).

Figure 73: Infant skeleton U. 16835 close to wall F. 5051 in Trench 5. Photo Peter Biehl

Figure: 74 W wall of space 342 in Trench 5. Photo West Tr 5-7 Team

It is interesting to note that both spaces show similar characteristics: the chunky brown and white roomfill and a thick white wall plaster. While the excellent structural preservation of animal bones in the two spaces can be attributed to the high content of lime in the roomfill; the low degree of fragmentation of the bones and the high number of large fragments of potshards indicates a rapid deposition. This is corroborated by the articulated deposition of the baby skeleton (16835) in Space 342. In sum, the described evidence in Space 310 could well be interpreted as representing the remains of an upper storey that collapsed together with pots and other finds that stood along the walls of the upper room (Figure 76). If this proves right for Space 342 as well, the frequent phytoliths in both Spaces 310 and Space 342 could thus be the disintegrated remains of mats that were part of the ceiling structure.

Figure 75: (left) Two layers of white wall plaster (U. 13726 and 17349) with red paint in space 310 in Trench 5. Photo West Tr 5-7 Team
Figure 76: (right) Shard Clusters in vertical position along the walls of space 310 (fallen down from an upper storey?) in Trench 5. Photo West Tr 5-7 Team

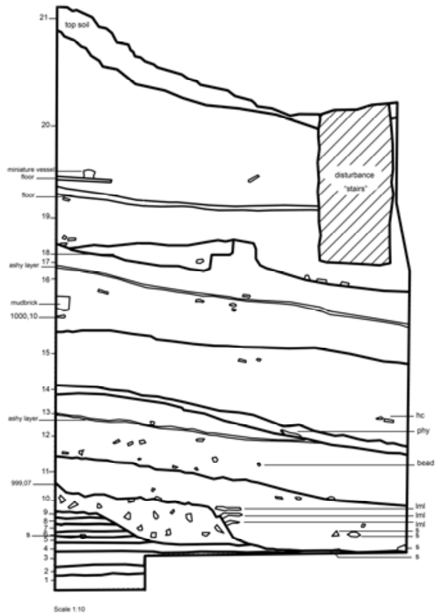

Figure: 77 Drawing of the North Profile of the Deep Sounding in Trench 7 (see also Figure 78 & Table 1) Drawing West Tr 5-7 Team
Figure 78: Photo of the North Profile of the Deep Sounding in Trench 7. Photo West Tr 5-7 Team

Table 1 - T7 Deep Sounding 2008, Northern- and Western Profile – Layer descriptions and key

Layer: Unit Number – Layer Description
1: U16904 – blackish-grey compact clay
2: U16905 – ochre silty sand
3: U16906 – ochre silty sand
4: U16907 – ochre silty sand
5: U16908 – ochre sand
6: U16909 – ochre silty sand
7: U16910 – ochre silty sand
8: U16911 – ochre silty sand
9: U16912 – ochre silty sand
10: U16913 – whitish-ochre lake marl with clay lumbs
11: U16914 – blackish-brown clayish compact non-laminated cultural deposit (fill: pottery sherds, bones, burned clay, charcoal, stones)
12: U16915 – brownish-grey fine laminated midden deposit (fill: pottery sherds, bones,burned clay, charcoal, phytoliths, obsidian)
13: U16916 – brownish-grey fine laminated midden deposit (fill: bones, charcoal, phytoliths)
14: U16917 – blackish-brown clayish compact non-laminated cultural deposit (fill: pottery sherds, bones, burned clay, charcoal)
15: U16918 – blue-greyish fine laminated midden deposit (fill: pottery sherds, bones, charcoal, phytoliths, seeds)
16: U16919 – lighter greyish harder slightly laminated cultural deposit (fill: pottery sherds,bones, burned clay, charcoal)
17: U16920 – lighter greyish harder slightly laminated cultural deposit (fill: pottery sherds,bones, burned clay, charcoal)
18: U16921 – greyish looser laminated deposit (fill: pottery sherds, bones, burned clay,charcoal, phytoliths)
19: U16922 – greyish compact non-laminated cultural deposit (fill: pottery sherds, bones, burned clay, charcoal)
20: U16923 – greyish compact slightly laminated cultural deposit, no upper layer limi recognizable (fill: pottery sherds, bones, charcoal)
21: top soil

Key
p = pottery
b = bone
s = stone
phy = phytolith
chc = charcoal
bcl = burned clay
cl = clay

N of Space 342 wall F.2426 runs parallel with wall F.5051, but is separated by a gap of a few cm and is made of brownish-yellow mudbricks with grey friable mortar. It binds into wall F.2425 in its W, which itself proved to be the continuation of wall F.5050 after the removal of the late grave F.2416. Wall F.5050 = F.2425 binds into a wall F.5074 running towards the W profile that is heavily disturbed by a late pit. With the W profile as its W definition, Space 343 with a NS width of almost 6m is the largest space defined so far.

Wall F.2425 binds into wall F.5056, thus making it highly possible that the architecture E of wall F.2425 = F.5050 forms one building with Space 343. A wall F.2413 = F.5055 (that like F.5056 consists of very compact greyish-brown mudbricks set without mortar) running parallel

Figure 79: Photo of the W, S and N profile of the deep sounding with sediments of natural in Trench 7. Photo West Tr 5-7 Team

to F.2425 = F.5050 was added with a 10cm interval in between. A buttress F.5053 measuring ca. 1,2m x 0,8m is attached to that wall and separates two spaces Sp.340 and Sp.341. Buttresses F.5052 and F.5057 form the E boundaries of these spaces. As the NE and E borders of the building have not been exposed yet, its relationship with the walls F.5051 and F.5070 that enclose another space in the NE corner of the trench remains to be clarified in 2009.

Trench 7

Since we were able to build a tent over Tr.7 this year and the light under the tent made several new layers visible, we decided to re-draw and re-document the N, W and S profiles of the deep sounding (Figures 77, 78, 79 & Table 1). We also decided to dig another ca. 30 cm deeper into natural to make sure that we could document all sediments of natural (see report Doherty). Due to safety concerns we decided not to excavate further in Tr.7 but plan to excavate with a machine a step trench in 2009 in order to clarify the architecture and contextualize the concentration of in situ storage vessels at the S edge of the trench (see Biehl/Rosenstock 2007).

The N-Profile in the deep sounding shows four building horizons on the eastern fringe of the West Mound (Figure 77 and Table 1):

The four (or at least three) building horizons (layers 20, 19, 18 and 16/17) are clearly separated by two plastered floors, which show in a close-up (Figure 80, see also the miniature vessel on the upper floor which corresponds with the four large storage vessels found in 2008 on such a surface but without any secure context - see Biehl/Rosenstock 2007) several layers of replastering. It is interesting to note that the two floors run roughly horizontal, which is contrary to the slope at the eastern fringe of the West Mound as well as the midden-like layers below the third building horizon, which follow the slope line. The earliest building horizon (layer 16/17: (16919) and (16920) is characterized by a lighter greyish harder slightly laminated cultural deposit with pottery shards, animal bones, burned clay, charcoal and dark mudbricks in the W-part of the profile; a thin ashy layer separates layer 16 and 17 and runs aslope almost parallel to the ashy layer (separating layer 12 and 13). Below the earliest building horizon there are laminated midden-like deposits (Layer 11 (16914), layer 12 (16915), layer 13 (16916), layer 14 (16917) and layer 15 (16918) with colour ranges from brownish-grey, blackish-brown to blue-greyish, and from clayish compact to fine laminated and consists of pottery shards, animal bones, burned clay, charcoal, obsidian and phytoliths and seeds (see report Ryan). These deposits sit on pits refilled with lumps of raw marl (see report Doherty), which indicate activities at this part of the West Mound prior to the four or at least building horizons (Layers 20, 19, 18 and 16/17). The exact function of these pits and more importantly the reason for their refilling and consequently their relationship with onsite and offsite activities can only be understood when we continue to excavate in Tr 7 as well as discern the real edge of the mound with the planned cores and test pits between the West and East Mounds. Also the C-14 samples as well as the pottery, which we have taken from all layers, will help us to reconstruct the beginning and development of the West Mound and its relation to the river and the East Mound; and eventually to confirm our hypothesis that there is a successive and probably even a settlement, which is contemporaneous with the one at the East Mound at the bottom of the West Mound. It is important to note again that the preservation of these undisturbed layers is exceptional and promises other in situ contexts.

Figure 80: Close up photo of a miniature vessel and latest floor. Photo West Tr 5-7 Team

General Observations and Outlook

In this field season we were able to define seven spaces, which seem to belong to at least four separate buildings with either single or double perimeter walls divided by gaps of ca. 10 cm. While the spaces in the S of the trench, i.e. Space 342, Space 310 and Space 345, all have walls made of compact grey mudbricks with hard white mortar, the walls in the N of the trench consist of either soft greyish-brown mudbrick with very friable grey mortar or very compact walls. Here individual mudbricks are hardly discernible and appear to be set when still wet without the use of mortar. Where discernible, a brick format of ca. 0,8 x 0,4m could be assessed. All buildings are oriented NS, and - with the possible exception of the S wall of Space 310 - no entrances could be detected so far.

The similarities with the roughly contemporary Can Hasan I layer 2B are striking not only in the overall layout, orientation and dimensions of the buildings (French 1998, 28, Fig.11) but also in the general brick size of 0.8m x 0.4m. The layout of the building with Spaces 340 and 341 closely resembles structure 5 in Can Hasan I 2B. The described internal buttresses are a common characteristic of the architecture of the 6th millennium BC in Central Anatolia. If we accept that a different climate causes different building techniques (see Rosenstock in press), we can see similar architecture with mudbricks on stone foundations as in Hacılar I (Mellaart 1970, plate 29) and Kuruçay 7 (Duru 1994, plate 24) in the Lake District of Western Anatolia. Related architectural patterns can be seen even further West in Aktopraklık in the Marmara region (Necmi Karul, pers. comm.) and in Greece at Tsangli (Wace/Thompson 1912, 155ff Fig. 64, 65; for a discussion of Anatolian parallels see also Duru 1994, 17).

As the preservation of walls in Can Hasan I 2B reached almost 3m in some places, French was able to document narrower walls on top of the foundation walls with the buttresses. He interpreted this construction as ledges for supporting the beams of the upper storeys and on which the walls of the upper storey were built. French was also able to identify postholes and remains of charred wood, which too indicate an upper storey - though this evidence could also be interpreted as a second building phase (French 1998, 38). Since he could not find any hearths he assumed that the ground floors with their buttresses were used as basements with storage areas. Also Mellaart (1970, 83) discussed a possible second storey in Hacılar I;

whereas at Tsangli Wace and Thompson (1912, 115) argued that the buttresses and postholes were support constructions for a roof. Duru (1994, 14) rejected a second storey because of the small amount of debris accumulated in the structures of Kuruçay 7.

As we have not yet reached the base levels of the walls exposed in Tr 5 it is too early for definite conclusions for this extremely interesting issue. But since the deep sounding in T7(Biehl/Rosenstock 2007, 127) and Building 25 (Gibson/Last 2003) as well as the preliminary results in Trench 8 (see Erdoğu 2007 and 2008) show an excellent preservation of the mudbrick architecture, further excavations on the West Mound will hopefully allow us to ascertain our hypothesis of a collapsed upper storey and therefore to understand the use of the buildings.

Other major changes include a faunal assemblage more heavily dominated by sheep/goat, but including cattle which now appear to be fully domesticated - also in contrast to the East Mound, prompting questions as to whether the East Mound is in fact not yet as 'really Neolithic' as the West Mound is. Moreover, recent findings of milk protein in Anatolian Chalcolithic assemblages hints together with the explosion of the pottery production in the LN – EC transition to an increased consumption of non-solid food, which might have been milk and milk derivatives such as yoghurt and cheese (Schoop 1998; Sauter et al. 2003; Evershed 2008). This would also explain the emergence of large storage vessels, which we found in T7 (see Biehl/Rosenstock 2007).

In order to date the beginning and consecutive development of the settlement on the West Mound we have taken samples of pottery as well as of animal bones for C-14 dates from all layers in the stratigraphy and hope that their analyses will provide a secure chronology. This chronology will be the backbone for the planned palaeoenvironmental research between the two mounds.

Trench 5-7 Pottery - Ingmar Franz

Freiburg University

The three main goals of this year's field season were: (1) Stylistic and typological analysis of the West Mound pottery in order to find the 'missing links' between the late Neolithic (LN) and the early Chalcolithic (EC1) at Çatalhöyük. Here the focus was to collect and analyze shard clusters and to reconstruct vessels. This approach will enable us to study the pottery both at a macro-level (vessel shape and size) and at a micro-level (vessel use and production technology). (2) The second goal was to process and analyze pottery excavated 2006 – 2008 from secure contexts. The analysis consisted of several steps which included describing, sorting, numbering, refitting, weighing and counting of shards in order to create a database for empirical and statistical comparative studies. And (3) to work out a recording system that would speed up the processing and analyzing of the enormous quantity of pottery produced by the West Mound excavations.

As a result we were able to define 37 reconstructable vessels: 18 vessels from Trench 5, six vessels from Trench 6, and 13 vessels from T7 (Table 2).

Secure contexts from EC1 room fill are available for most of the vessels from T5 (Figure 81).

The other Trenches have so far not produced any secure contexts, but can be attributed to certain vessel (V) types:

T7 (2 vessels):
V5: a cluster of LN cut & prick-ornamented shards from U. 15104, 15106, and 15107 (Figure 82)
V15: a red painted EC1 necked jar from U. 15107 (Figure 83)

T5 (5 vessels):

V9: red painted slightly restricted carinated bowl with four vertical loops beneath the rim U. 17213 (Figure 84)

V14: red painted necked jar or basket handled vessel from space 345 (U. 16832) (Figure 85)

V37: small unpainted reddish-brown, carinated-unrestricted, footed S-profiled bowl with well burnished surfaces from space 310 (U. 17208) (Figure 86)

V29: carinated-restricted, flat-based C-profiled bowl with well burnished surfaces and a red painted zigzag pattern from space 310 (U. 17208) (Figure 87)

V12: unpainted brown, carinated-unrestricted bowl with S-profile, slightly vaulted base and burnished surfaces from space 342 (U. 15308) (Figure 88)

Table 2 Defined vessels in each trench.

	Trench 5	Trench 6	Trench 7
vessel code (Vx)	8, 9, 12-14, 17, 18, 20, 21, 24, 25, 27, 29-33, 37	10, 19, 22, 26, 34, 36	1-7, 11, 15, 16, 23, 28, 35

Figure 81: Distribution of secure contexts from EC I roomfill and vessel types in Trench 5. Plan Ingmar Franz

Figure 82: Cluster of Late Neolithic cut & prick-ornamented shards (V5) from U. 15104, 15106, and 15107 in Tr 7. Photo Ingmar Franz.

Figure 83: (left) Red painted EC I necked jar (V15) from U. 15107 in Trench 7. Photo Ingmar Franz.
Figure 84: (right) Red painted slightly restricted carinated bowl with four vertical loops beneath the rim (U. 17213, V9). Photo Ingmar Franz.

It is important to note that we found traces of white color on the inner surface of some shards from undecorated, carinated unrestricted bowls (from U. 13843, 15104, 15105, 15300, 15308, 16832 and 16896). We are planning to do scientific analyses (thin sections, XRD and chemical analyses) on these shards in order to better understand their production technology and their possible function.

We also counted and weighed parts of diagnostic as well as undiagnostic shards from 2006-2008. In this process we measured the maximum diameter of the largest shard of each unit. By the end of this season more than 220 kg (over 9.000 shards) of pottery have been processed (Tab. 3).

At the end we would like to mention three extraordinary finds of this year's excavation: (1) we found three red pigment stones in spaces 310,342 and. 343. (2) The discovery of pieces of unbaked pottery in space 310 (U. 16898, 17208, and17214), space 340 (U. 16880), space 341 (U. 16859), space 342 (U. 16889, 16896, and 16899) and space 345 (U. 16832) - including several pieces of formed and painted but unbaked pottery - provide us with important hints regarding pottery production activities on the West Mound. And (3) we found a painted base part of a bowl from space 342 (U. 16896) with an anthropomorphic 'stick-figure' painted on the inner surface (Figure 89).

Figure 85: (left) Red painted necked jar or basket handled vessel from space 345 (16832, V14). Photo Ingmar Franz.
Figure 86: (right) Small unpainted reddish-brown, carinated-unrestricted, footed S-profiled bowl with well burnished surfaces from space 310 (U. 17208, V37) from Trench 5. Photo Ingmar Franz.

Figure 87: (left) Carinated-restricted, flat-based C-profiled bowl with well burnished surfaces and red painted zigzag pattern, from space 310 (U. 17208, V29). Photo Ingmar Franz.
Figure 88: (centre) Unpainted brown, carinated-unrestricted bowl with S-profile, slightly vaulted base and burnished surfaces from space 342 (U. 15308). Photo Ingmar Franz.
Figure 89: (right) Painted base part of a bowl from space 342 (U. 16896) with an anthropomorphic 'stick-figure' painted on the inner surface. Photo Ingmar Franz.

Acknowledgment:
I would like to thank Daniel Lawrence, Dilek Çekiç and Onur Yüksel for their tremendous help with processing the pottery.

Description of the natural sequence - Chris Doherty

Oxford Research Laboratory for Archaeology

Trench 7 was successful in reaching the bottom of the cultural deposits and exposing the natural sediments. These are described here, starting with the earliest layer (see Figures 77, 78, 79 & Table 1):

Layer 0 - The base of this sequence is the Pleistocene marl of the former Konya Lake. At Trench 7, this is a slightly sandy marl whose surface has been weathered during subaerial exposure. Across the base of the excavation, the surface elevation varies by about 15 cm, being lowest in the southwest corner. The surface has numerous dessication cracks of up to 5cm depth, which are infilled by the first of the Holocene sediments (layer 1).

Layer 1 – (16904) “blackish-grey compact clay”. This silty clay is not actually a homogeneous layer but has an upper black zone transitional into lower bluish-grey one, which directly overlies the marl. The grey clay is equivalent to the “Lower Alluvium” with the difference here being that the black "organic layer" lies above the alluvium, rather than separating it from the marl. However, this transition from grey to black does not seem to be a direct expression of the original sedimentary features, as the boundary is irregular and highly diffuse, often appearing more like a black mottle. This suggests that the grey-black transition is due in part to soil-forming processes.

Inspection of a sample of this silty-clay showed that it has 10-15% (by volume) of very fine (<0.5mm) volcanic minerals (plagioclase feldspar, biotite mica and calcium amphibole) but no coarse fraction. The presence of numerous slickensides indicates that this layer underwent repeated wetting and drying and the presence of calcified root channels (showing a consistant vertical orientation) confirms both a seasonally fluctuating water table and a vegetation cover. Layer 1 records the rise of the water-table at this location, due in part to occasional flooding. This resulted in a seasonally wet ground surface and the development of a thin vertic soil, but without any direct evidence for sedimentation from moving water.

Layer 2 – (16905) “Ochre silty sand”. This silty layer has a weakly erosional contact with the underlying grey-black silty clay and indicates the arrival of slow moving water, probably as an ephemeral stream or sheet-flow. Again this is not a homogeneous layer, but consists of a matrix of greenish calcareous clayey-silt in which there are numerous dark grey-black or (less commonly) brown-red clay inclusions. These are fragments of the underlying “Lower Alluvium” which have been stripped off by a (slowly) flowing current. The large size of many of these clay fragments combined with their high frequency and angular shape, indicate that they have not been moved a significant distance. This layer represents the onset of intermittent stream flow, where the dried surface is being seasonally reworked.

Layer 3 – (16906) “Ochre silty sand”. A layer of cleaner silt with a lower clay content than layer 2. The contact against the latter is slightly erosive which, taken with the very well-sorted grain size and reduced clay content, indicates the first arrival of permanent stream-flow. However, the uniform grainsize of this calcareous silt, and the lack of any coarse sand, indicates only a relatively slow-moving current.

Layer 4 – (16907) “Ochre silty sand”. This is essentially same as layer 3 but has a slightly higher clay content, indicating a reduced rate of stream-flow, probably as a result of meandering.

Layer 5 – (16908) “Ochre sand”. This is the same as layer 3 and indicates the return to slightly faster stream-flow conditions, again indicating that the channel is now meandering.

Layers 6 - 9 – (16909) – (16912) “Ochre silty sand”. These are all the same calcareous silts as for layers 2-5 but have been deposited under slightly different conditions. Unlike the preceding silts, these all show small ripples and form a series by of thin planar sheets. These sedimentary structures indicate the prevalence of slightly faster stream-flow, as the ripples points to an increased capability to transport sediment. Despite this, there is still no evidence of this stream carrying any coarse material.

In summary, this natural sequence of layers 0-9 records first the water table rising nearer to the ground surface, followed by the progressive development of moderate stream-flow. The sediments suggest a weakly meandering stream at Trench 7, but one, which is insufficiently active to transport a coarse sediment load or to form levees.

This natural sequence is cut into a series of small pits, which were just being seen at the end of the 2007 season. The stratigraphy now becomes archaeological rather than geological, but it is relevant here to make a few observations on this transition:

1) Clearly the stream conditions had ended and the land surface dried out by the time these pits were dug. Unfortunately it is not possible to comment on the length of exposure from the degree of weathering of these silts as their top layers have largely been removed.
2) The pits are of a similar size to those documented at KOPAL, but no marl is being extracted here, only silt/fine-sand.

3) Such material may have been removed for mudbricks as similar calcareous silts/fine sands of this type were used for some of the 4040 Area mudbricks. It is not yet known whether there is a match with any of the west mound bricks.

4) Interestingly, these pits are then filled with lumps of raw marl, but at Trench 7 marl is available only below the level of the pits. This suggests that the marl is being derived from another source nearby. Several other field geology observations indicate that the West Mound was located on an elevated marl area, and it is possible that this material is being derived from up-slope activity.

5) But as marl is generally a commodity, which is being extracted, why should it be used to fill in these pits?

Phytolith analysis 2008 - Philippa Ryan

University College London

Samples were taken as small blocks of sediment (circa 5 cm in depth) from units (16921), (16918), and (16946) of the Tr 7 sections. Several thin (2-3mm depth) horizontal visible lines of phytoliths could be seen running across the extent of the units sampled. In the phytolith laboratory the top of each block was scraped down until the phytolith lens was visible in order to assess any patterning. Visible phytoliths were removed with a scalpel. The samples were processed with methods described in the 2006 and 2007 phytolith archive reports. Phytolith remains require less processing than sediment samples: carbonates are removed with 10% HCl, dried, and then mounted onto a slide with Entallin. Slides are analysed under X400 magnification.

Samples analyzed
1. (16921)
Horizontally compressed patches of phytoliths with no patterning.
Multicell silica-skeleton phytoliths from Cyperaceae (sedge) stem leaves/stems.

2. (16918)
Horizontally compressed patches of phytoliths with no patterning.
Multicell phytoliths from Phragmites sp. (a reedy grass) leaves and stems and sedge leaves/stems.

3. (16946)
As well as horizontally compressed patches of phytoliths with no patterning, leaf and stem impressions are present throughout the block in various directions indicating some difference in the deposition of this plant material compared to the other two samples. The assemblage is dominated by phytoliths from Phragmites sp. leaves and stems and sedge leaves and stems, however the multicells are more fragmented with a higher number of single cell phytoliths. In contrast to the other two lenses sedge inflorescence multicell phytoliths are also present

indicating perhaps a different season of plant deposition (summer/ early autumn) and the sedge cone phytoliths within these multi-cell are all from one type of sedge.

Discussion

All of the phytoliths present are from wetland plants. The more taxonomically identifiable sedge multi-cells (where stomata and/or sedge cones are present) are all from predominantly one sedge type. All the phytolith types are commonly found on the East mound. Notably these are not ashy deposits or the remains of woven remains - if these were from woven remains some patterning should be visible. These remains are well sealed deposits and represent the insitu decay of wide horizontal extents of plant material.

Acknowledgements

The 2008 field season at the Çatalhöyük West Mound was funded by State University of New York at Buffalo and the Free University Berlin. We are also grateful to the Çatalhöyük Research Project.

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Selçuk University Team - Asuman Baldiran, Zafer Kormaz

Supervisors: Asuman Baldıran, Zafer Korkmaz,
Assistants: Numan Arslan, Derya Boluk, Dilek Çekiç, Ramazan Gündüz, Görkem İlarslan, Utku Yalçın, Onur Yüksel, Ayşegül Tabakoğlu, Ömür Özkanlı.

In 2008 season, the Selcuk University team conducted excavations in Trench 5. During the cleaning process an alabastron was found at the south edge of the trench (Figure 90). We began the season by continuing on from last season the excavation of burial F.2419 (Figure 91). This revealed units (16831), (16832) and (16840) that contained dense charcoal and Chalcolithic and Byzantine period potsherds. The excavation exposed Chalcolithic walls to the south and west of the burial cut. Once burial F.2420 was fully recorded after the skeleton's removal in 2007 the trench was expanded by 95x50cm to the southeast as unit numbers (16809) and (16815) in order to expose the mudbrick walls in this area. We identified two different deposits by the end of the excavation.

Figure 90: Alabastron found in the cleaning layer. Photo West Tr 5-7 Team

A number of cuts were investigated which on initial excavation appeared as simple earth burials. Within the fill were scatterings of bones and potsherds. The cuts lay on a north-south direction and contained mixed soil. On reaching a hard basal Chalcolithic horizon without encountering any human remains we suggest that these cuts may be animal disturbances. These cuts and fills are represented as unit numbers (16804), (16805), (16818) and (16819). Cuts (16804) and (16805) truncated a Box Grave with a Brick Base type burial in a north-south direction.

Figure 91: Excavation continued in F.2419. Photo West Tr 5-7 Team

Excavation of F.5060

Only one burial was excavated by us this season. This is represented as cut (16892) and fill (16893). This burial was also a Box Graves with Brick Base type burial similar to the ones we came across during last year's excavations.

The southwest brick wall was exposed and we observed that the fill (16885) on the northeast of the burial was very mixed which was the reason for the difficultly in exposing a clear coursing of bricks on that side. The burial was allocated F.5060 feature number. The skeleton (17200) was lying in an east-west direction and only the left foot and hand bones were recovered, the rest of the pieces were missing (Figure 92). The only finds that were retrieved from the burial were coffin nails. After removal of the skeleton we observed that the burned mudbricks are as deep as 10 cm and we stopped the excavation when we reached the Chalcolithic ground. The current count of Box Graves with Brick Base is now.

Figure 92: Burial F.5060. Photo West Tr 5-7 Team

Trench 8 - Burçin Erdoğu

Supervisors: Burçin Erdoğu
Assistants: Nejat Yücel, Gülay Yılankaya, Melek Kuş, Sedef Polatcan, Abdurrahman Sönmez.

Introduction
A short season of excavation on the West Mound Trench 8 at Çatalhöyük was undertaken with the primary aim of extending the plan of the "Red building" (now Building 78) investigated in the 2007 excavation season (see Erdoğu 2007). Our work has served to put forth new research questions such as are there any architecturally more complex buildings in Chalcolithic Çatalhöyük West that characterize the Neolithic East mound? Or can we interpret the "Red building" as a house with a ritual dimensions? Our future research in Trench 8 will be focused on such questions.

Summary of Excavation
The work this season has served to clarify the plan of the "Red building" (B.78). Now it is almost clear that B.78 was a collapsed building with two storeys (Figure 93). Floors of the first and the second storey as well as plastered walls of the second storey were painted in red. The building has 3 internal buttresses, which the second storey was supported by. The collapse of the second storey floor formed semi circular slope offs around the buttresses to the north and west (F.2953 and F.2958). The third buttress F.2952 to the east is an important feature of the building. It measures 1.3x1.0 m. and it stands to a height of c. 1.5 m. Its surface was heavily plastered through multiple applications.

Figure 93: (left) Possible Reconstruction of Building 78 (not to scale) West Tr 8 Team, (right) Building 78. Looking North. Photo Nejat Yücel

This season, the trench was extended 1 m to the north to expose the complete plan of Building 78. The north east corner of the collapsed second floor and the northern mud-brick wall (F.2962) of the building were exposed (Figure 94). The east-west running wall F.2962 was constructed with different sized mud bricks and it has been cut by the pit (15563). In the far northwest corner of the trench, the large EC II Pit (15562) was also excavated. It was associated with (15537), which was excavated in the 2007 season.

The floor of the second storey consists of a c. 25-30 cm thick layer of white plaster. Approximately 5 layers of red paint visible to the necked eye. A micromorphology sample was taken on this floor to examine it much more detail. Wall F.2956 collapsed in domino fashion over the southern part of the floor. Bright red paint can be seen on its surface.

The first floor of the building was exposed in the north eastern corner of the building only. An area of c. 2.5x3.5 m. was opened up in the centre of the building to create an artificial section.

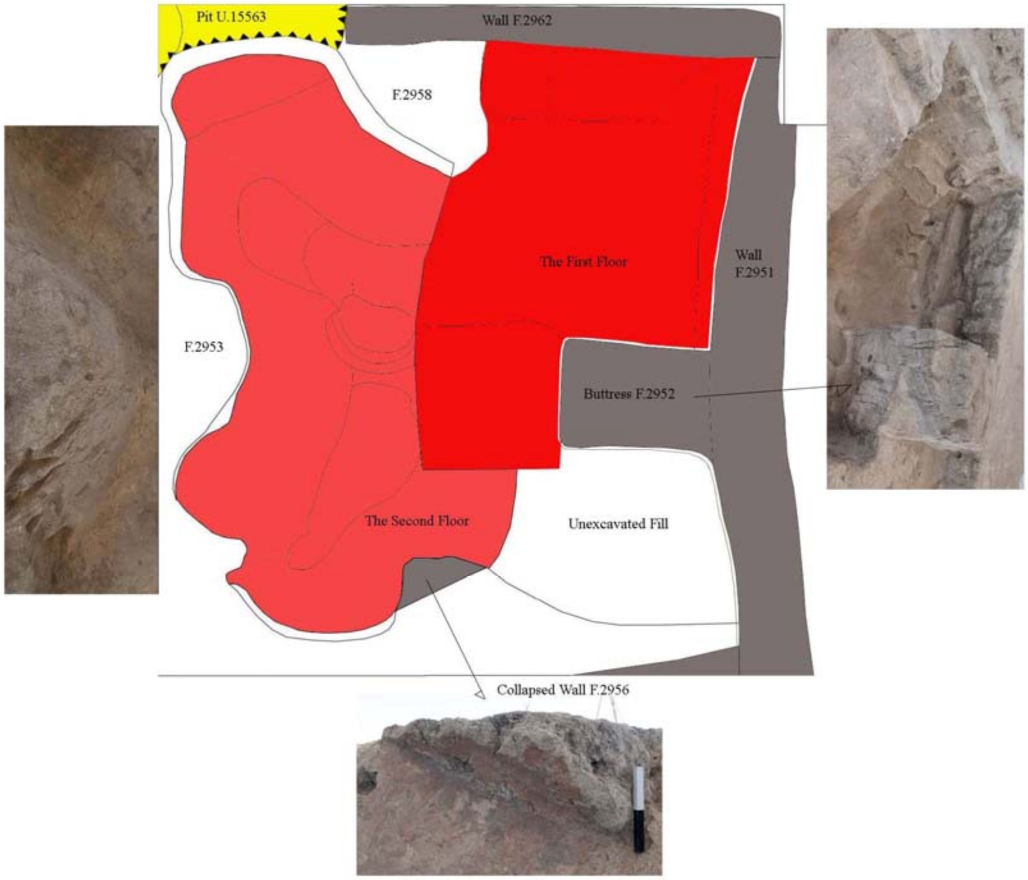

Figure 94: Plan of Building 78. West Tr 8 Team

Figure 95: Floors and the East Buttress F.2952 of Building 78. Photo Nejat Yücel

This operation helped us to gain a better understanding of the relations between the two storeys. The second floor collapsed onto the underlying floor of the first storey. The first floor also collapsed into a possible basement. Several fragments of flooring with different heights were found (Figure 95). A thin layer of red paint can be seen on finely laminated floor surface. No features such as oven or hearth were yet found on floor, but probably there was a narrow bench against the eastern wall. Some strange features consist of burnt mud-brick bases were found against the northern wall (see Figure 93). Their function is obscure. The floor surface yielded only a few finds. A large grinding stone and some almost complete pots are noteworthy (Figure 96).

Figure 96: A pot found on the floor. Photo Nejat Yücel

The small finds

The most exciting find for this season was a piece of copper tool (Fig. 97). The earliest copper objects were found in the pre- pottery Neolithic sites of Anatolia such as Çayönü and Aşıklı Höyük (Yalçın 2008). The native copper was heated and formed by hammering for producing mainly beads and awls. Copper objects were also found in the pottery Neolithic settlements of Çatalhöyük (Yalçın ibid). Most exciting copper finds were from the Early Chalcolithic site of Canhasan where a copper bracelet and a mace-head were found. (Yalçın ibid). There can be no doubt that this first copper tool from the Chacolithic Catalhöyük West was an important find for the development of ancient metallurgy in Anatolia.

Figure 97: Copper tool. Photo Nejat Yücel

Pot stands are also important finds of Catalhoyuk West. A total of 16 decorated pot stands were found. They are decorated with incised lines. Occasionally, lines are combined with dot impressions. One pot stand was made in the shape of animal. Ears were shown in relief. I discussed earlier (2007) that during the Chalcolithic West mound the main focus of symbolism and decoration had shifted to portable objects. Pot stand motifs from the West mound look like schematic representations of wall paintings of the Neolithic East mound. Use of different motifs in pot stands probably has a symbolic role rather than an aesthetic anxiety. It is probably that the more the decoration on pot stands, the greater will be their symbolic load.

Dr. Fuat Yılmaz from Thrace University joined our team for pottery drawing in this season, and we have created a catalogue of the Chalcolithic pottery shapes.

Discussions

The "Red Building" differs from a usual domestic architecture. Red is one of the earliest and most widely recognised colours. A primacy may be a product of cognitive classification, but could also derive from its frequent association with blood (e.g. Wreschner 1980; Gage 1999b; Jones and Bradley 1999). The symbolic link between red ochre and blood or life was ethnographically recognised (e.g. Turner 1967). Red paint has been found in many buildings on Çatalhöyük East. It generally occurs on graves and figurative mouldings. Some platforms and thresholds between rooms were also painted in red (Hodder 2007:321). Recently, a building with very large platforms with a red painted dado on the all of its central platform was found (Brown 2006). According to Mellaart (1967: 149-150) red symbolised blood and life and it has a protective function in Catalhöyük. "It wards off evil spirits and protects the object so decorated, be it the body of the dead, the wall of the house or shrine near which he slept, the bench or platform on which lie sat or slept, the posts which support his roof and which might fall down, the boxes in which precious possessions were kept or the baskets in which his food was stored".

Use of red colour in the Neolithic architecture of Central Anatolia has long been recognised (cf. Asikli Höyük: Esin and Harmankaya 2007; Musular: Özbasaran et al. 2007; Canhasan III: French 1972). A special building complex was found in the south western part of the Pre-pottery Neolithic site of Aşıklı Höyük (8500-7500 cal. BC). The complex consists of two main structures HV and T. The floors and interior walls of T were painted in red (Esin and Harmankaya 2007). A small room AB lies close to the building T. One of two graves found under the floor of this room had trepanation in her skull, and interior walls of the room with the burials were painted in red (Esin and Harmankaya 2007). The Pre-pottery Neolithic site of Musular (7600-6600 cal. BC) is located ca. 400 m west of Aşıklı Höyük. Building A at Musular can be compared with the building T at Aşıklı Höyük (Özbaşaran 2003). It has red painted lime plastered floor. Both building T at Aşıklı Höyük and building A at Musular, interpreted as special buildings, where probably where ritual activities took place (see Duru and Özbaşaran 2005). For prehistoric societies their "ritual" buildings are probably the very centre of their perceived world and their cognitive existence in that they express a feeling of belonging, social obligation and identity. I believe that the Red Building of Catalhöyük West is a special building used in some form of domestic (?) ritual. However this hypothesis needs to be confirmed by much more detail investigations.

The discovery of a special building at Çatalhöyük West is exciting, and we will continue our investigations in further seasons so that the nature of Early Chalcolithic settlement and architecture can be better understood.

Acknowledgements
The 2008 excavation was made possible by generous grants from the University of Thrace Research Fund (TÜBAP-758) and the Esentepe/İstanbul Rotary Club. I wish to thank Güneş Duru, Nuray Kaygaz and Mihriban Özbaşaran for their comments on architecture.

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CULTURAL AND ENVIRONMENTAL MATERIALS REPORTS

Çatalhöyük Animal Bones 2008 - Nerissa Russell & Katheryn Twiss

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Abstract
The faunal team recorded 67,292 bones from ca. 255 units in the 4040, South, IST, and TP areas and the West Mound. We concentrated on working toward next summer's study season by recording deposits related to occupation from Buildings 49 and 77 in the 4040 Area and the Building 44/56/65 sequence with associated middens in the South Area, as well as the TP Area. We were able to shed light on unusual deposits excavated and recorded in 2004 in Building 49 in light of this year's excavations. Building 77 provided dramatic in situ animal bone installations, as well as significant deposits on the floors and in the fill. In the South Area we have added to the knowledge of the post-Level VI middens, which are heavily composed of highly processed discard from daily meals, somewhat similar to the Space 181 dumps from early in the sequence as well as the TP middens from later.

Introduction
In 2008 we added 67,292 bones from roughly 255 units to the database. We now have almost 900,000 specimens from 3034 units in the database. The main goal for the season was to begin work on the deposits to be targeted for next year's study season and the coming publication. Our team's particular focus was on deposits associated with the Building 44/56/65 sequence in the South Area and on Buildings 77 and 49 in the 4040 Area, as we aim to record all deposits related to occupation (i.e., excluding redeposited bone in construction material, fill, etc.) from these locations. Additionally, material from the West Mound was assessed for a preliminary look at the fauna from Trench 7 (deep sounding) and Trench 5.

South Area
South area units were prioritized for analysis in 2008 according to the following criteria:

1) Full recording of all indoor use deposits as well as activity deposits (e.g., fire spots) from adjacent extramural zones and from immediately beneath Building 65.
2) Full recording of as much as possible of the rich midden sequence in Spaces 319 and 339. (The units are very large, so sampling within the sequence was necessary, and further analysis of the lower deposits is a priority for 2009.)
3) Assessment of all units associated with the building sequence 44/56/65 and the surrounding spaces.

In the pursuit of these goals, the faunal team looked at material from 209 new South Area units and added data to 21 units that had previously been at least partially recorded. 59 of these units were fully recorded, 22 were partially recorded (tools or special finds only), and 148 were assessed. In total, 44,675 South Area specimens (1146.5 diagnostic zones; 72,048 grams of bone) were analysed in 2008.

Indoor and Outdoor Activity Deposits
Use deposits from inside the Buildings 44/56/65 sequence were recorded in previous seasons, and no new, faunally significant units were studied in 2008. We did examine two tiny, phytolith-rich deposits from B.65 (units (15703) and (15705)), primarily to assure comparability with the botanical data; both contained only incidental chips. Analyses of several fire spots directly below Building 65 (units (15772), (16218), (16219), (16220), (16226), (16227), and (16231)) also were undertaken for comparability reasons and also yielded scant data.

Building 75 likewise contained few use deposits with appreciable faunal material. Unit (16268), a seed-rich stone cluster around the oven makeup, proved on assessment to consist of very clean background fill, unrelated to the use of the oven. (16523), in the building's southwest corner, was partially recorded as it a) contained two bone points, a young cattle scapula, and an antler haft, but b) was judged probably a dump, not in situ.

The Midden Sequence in Spaces 319 and 339

Portions of the Space 319 middens were excavated and analysed in 2007 (e.g., units (15702), (15728)), and were discussed in last year's archive report. The 2008 excavations in this area completed removal of these deposits and continued downwards. The complete sequence of middens stratigraphically respecting Building 44 is as follows: units (16253), (16258), (16259), (16260), (16262), (16277), (16507), (16534), and (16568). (16253), (16259), and (16262) were fully recorded in 2008; (16260), (16507), (16534), and (16568) were partially recorded (tools only). 16258 was visually evaluated, but not officially recorded.

The upper midden deposits that respect Building 44—units (16253), (16258), (16259), (16260)—were heavily dominated by caprine remains, although cattle, equids, boars, dogs, foxes, and birds were also present (Figure 98 A, B). The caprine remains come from all parts of the body, and are heavily processed. We found little burning, but considerable amounts of digestion, indicating that dogs had access to these middens. Very few worked bones were present. Despite the presence of a few scattered and nonarticulating human remains, we interpret these middens as dumps of quotidian consumption remains. Bone surface conditions range from fresh to moderately weathered, suggesting variable rates of accumulation.

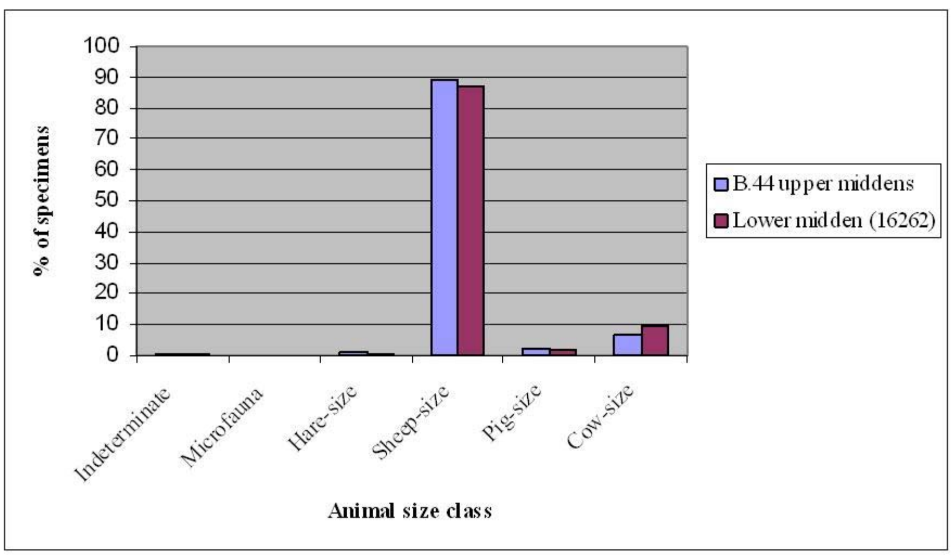

Figure 98 A

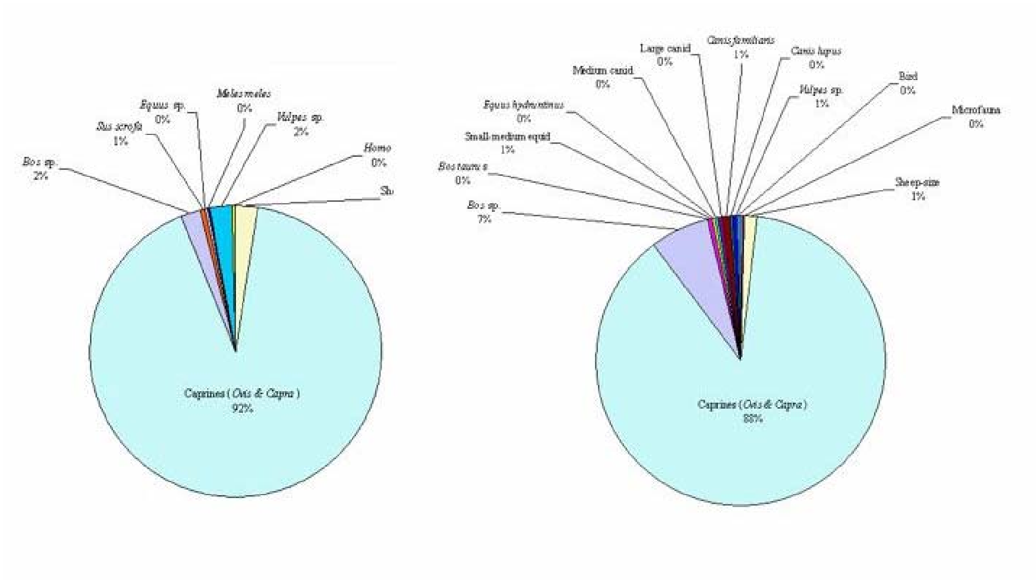

Figure 98 B & C: Taxonomic representation in the middens that respect Building 44. Fully recorded units only. A) Proportions of animal size classes in the two upper middens (units (16253) and (16259) vs. the lower midden (16262). B) Diagnostic zones in the upper middens (units (16253) and (16259)). C) Diagnostic zones in the lower midden (unit (16262)).

Lower down in this sequence, unit (16262) was also dominated by heavily processed caprine remains (Figure 98 A, C). However, it contained more remains from large animals (mostly cattle, very little equid), and many of these remains were in relatively large pieces. Unit (16262) also contained a complete dog skull and a wolf mandible. Bone surface conditions are not particularly fresh, but they are slightly better than those in the layers above. Like those above, this midden consists primarily of daily consumption remains, but the focus is less exclusive than in units (16253) - (16260).

The middens that stratigraphically respect B.56 and B.65 have not yet been significantly studied. Worked bone was recorded from B.56-associated deposits (16590), (17017), and (17047); (17042) and (17045) were assessed (as fill); and two bones from (17017) were recorded so that they could be sampled for isotopic analysis. A few small fire spots within this sequence were analysed: assessments were done for (17005) and (17007), fire spots below (16590), and (17008) was fully recorded. They look like accidentally-included fill, not activity deposits.

Since the outdoor spaces associated with B.65 all proved to be linked (i.e. Spaces 299, 305, and 339 are in reality all the same space), middens initially identified in Space 305 are also present in the erstwhile Space 339. The excavators thus used the unit numbers of the Space 305 middens when excavating the new portions that came from beneath the B.44 & 56 deposits where possible. We did not have time this season to analyse the portions that came from below Space 339, but Space 305's unit (15717) (excavated in 2007) was assessed. Unfortunately, it was only a small deposit, as the midden was truncated by a 1960s trench, and contained no diagnostic zones.

Assessments

As noted previously, we worked in 2008 to assess all units, not just in situ ones, from the Buildings 44/56/65 sequence and from the adjacent spaces. The only exceptions to this plan were units that we hope to analyse fully in future seasons, such as the remaining Space 339/299 middens. Dr. Sheelagh Frame therefore dedicated the bulk of her labour during the 2008 field season to assessments; only if assessment revealed an unexpectedly interesting unit did she fully record it.

Many of the assessed units were only partially sieved, or were recovered using methods that were difficult for us to ascertain from the site database. The data from these units are therefore not taxonomically or statistically comparable with those from fully sieved deposits. Furthermore, as excavations in the South area stopped only a couple of days prior to the majority of the faunal team's departure from site, not all of the sequence's units could be recorded. Nonetheless, the 2008 assessments provide us with descriptive accounts of the majority of this area's faunal assemblages. These deposits cannot be broadly summarised, as they range widely in type (including bricks, foundation trenches, fire spots, fills), in size, in taphonomic history, and in recovery method. Table 3 lists the South Area units assessed in 2008.

Table 3: South Area units assessed in 2008. Italicized units were at least partially recorded in previous seasons. Unit number

Unit number				
1526	13344	14839	16233	16518
1572	14028	15712	16235	16521
4127	14033	15717	16237	16522
4130	14057	15718	16238	16536
4418	14066	15720	16239	16543
4698	14081	15721	16245	16548
4701	14090	15726	16246	16550
4705	14310	15727	16247	16552
5205	14312	15729	16248	16558
8076	14313	15733	16261	16559
8077	*14504*	15736	16267	16560
8078	14518	15740	16268	16562
8084	14526	15744	16270	16564
8085	14527	15745	16271	16565
8086	14531	15746	16272	16567
8088	14532	15752	16274	16570
8089	*14533*	15767	16276	16571
8093	14552	15770	16280	16572
10619	14560	15781	16281	16575
10627	14568	15783	16282	16576
10629	14569	15785	16284	16577
10639	14586	15788	16286	16578
10643	14588	*15789*	16287	16581
10668	14594	15791	16289	16583
11227	14803	16201	16291	17005
11288	14814	16202	16294	17007
11368	14816	16206	16296	17032
11690	14826	16209	16514	17042
12597	14830	16225	16515	17045
	14831	*16232*	16516	

4040 Area

In the 4040 Area we concentrated this year on recording and assessing priority and primary/secondary deposits backlogged from previous years, and beginning work on this year's material, mainly from Buildings 49 and 77.

Notable among the backlogged units are some from midden areas. (10380) from Space 268 was thought to be redeposited midden material in a large pit dug into midden. However, the animal bone does not appear redeposited. Rather it resembles standard midden material, but particularly rapidly deposited. (13142) and (13164) from Space 280 were described as parts of lime burning episodes, but the animal bone in both cases indicates rapidly deposited middens that burned in situ, but not at the temperatures associated with lime burning. (13107) in Space 279 was flagged in the field as a possible feasting deposit. This is supported by our analysis, although there is an admixture of ordinary midden material. It tends to large rather than sheep-size mammals, fragmentation is low, and meaty body parts are over-represented. Deposition was rapid.

In Space 271, a narrow outdoor space south of Building 52, we assessed (16714) to determine if it was a trampled surface. The flotation sample was intended to represent this surface, while the dry-sieved would be the fill below. Our analysis does not support the interpretation of this as a surface in a high-traffic area. There is no trample polish and the fragments are too large in the flotation sample. However, in comparison to the dry-sieved material, fragmentation is higher, surface condition poorer, and there are indications that it was much more extensively worked over by dogs. Thus the faunal evidence suggests not trampling, but a surface that lay exposed for a time, following the more rapid deposition of the midden material below. This slow deposition and exposure to dogs seems to have continued in the space, as the material from overlying (14191), separated from (16714) by a firespot and a layer of rubble, looks very similar to the flotation sample from (16714).

Building 60

We completed units of potential interest in Building 60. (12974) and (12997) are the fills of two small pits of uncertain function. Unfortunately, the animal bone does not shed light on their functions, but simply looks like standard fill material. A possible exception is a single fragment of possibly human sacrum from (12974); human bone experts were unsure of its identification. This fragment is larger than the other material in the unit, and in better condition. Similarly, the bone from (12965), hearth fill with in situ burning, must be from surrounding deposits as only two pieces of 24 are burnt, and not very heavily. This assemblage looks like ordinary, redeposited fill or construction material. (12953), described as platform make-up or dirty floors, looks like regular clean platform material as far as the animal bone is concerned.

Building 67

We studied three related deposits in Building 67. (13405) was fully recorded, while (13406) and (13407) received phase 1 assessment. In (13405) and (13406), this deposit is rich in bone and heavily sheep/goat with a range of ages, mainly meaty body parts with low fragmentation and high integrity. This suggests a feasting deposit, or at least a rapidly accumulated, minimally processed, single-purpose deposit of consumption waste. It also includes a number of bird bones, mainly wings. (13407) does not in fact seem to be part of the same phenomenon, but looks like redeposited fill material. We also assessed (13416), which is stratified below (13405) and contained cluster (13418), a dump of knucklebones and flat, round, black and white stones. Faunally, this unit seems to contain some of the same feasting(?) deposit as (13405), no doubt from the upper portion, and redeposited fill material.

Building 49

We did not record much material from Building 49 this year, as much of the material excavated this year originated from building makeup or floors. Sixteen units from Building 49 were studied this year: two assessed, three partially recorded, and eleven fully recorded. 1564 pieces of bone were recorded, of which most (1303 pieces) originate from a single platform construction unit (14460). Several dirty floor units were analysed to explore the area around the oven, but very little faunal material was recovered from those units; the dirty floors mostly contain what looks like background noise, if they contain any faunal material at all.

Units of interest from this year's analysis include unit (14460), platform makeup, and unit (14471), platform make-up below (14460). Unit (14460) is a continuation of (7957) excavated and recorded in 2004. It is a high-integrity deposit of primarily sheep and goats, with secondary deposition of a few fragments from equid, cattle, and pig. Unit (14471), immediately below (14460), is quite similar, and may represent similar kinds of short-term deposition of sheep and goats, with some secondary deposition of larger animals. Both units have relatively even body part distributions and butchery marks that may reflect a consistent butchery pattern of potentially-whole animals. These assemblages resemble components of abandonment deposits we have seen in, e.g., Buildings 52 and 65, but the surface condition is even fresher. The preliminary interpretation of the excavators, which is consistent with the animal bone, is that these are the remains of ceremonies associated with a remodelling episode, parallel to abandonment deposits.

Building 77

Building 77 is a well-preserved burnt building excavated in 2008. The excavation was not complete when the faunal team left, so we could only begin studying its contents. So far we have recorded parts of the fill and some of the in situ special deposits. Our discussion is therefore preliminary and impressionistic.

Building 77 retained three animal bone architectural installations in situ, all in the northeast corner (see Figure 3). Two clay pillars on the south and west edges of the northeast platform remain standing, each with an intact set of cattle horns set into it. Both sets of horns are from large male aurochsen. It appears that the connecting skull is inside the pillars, and, judging from the form of the holes from which the horns protrude, the sheaths were in place on the horns. With the sheaths, the horns of the two pillars would have criss-crossed and completely fenced off the platform. On the north wall above this platform is a small plaster head with slight stubs of sheep horns set into it. The horns appear to have been broken off before the house burned. Again, it is likely that the connecting skull is inside the moulded head. The head is too wide for a sheep skull, but the plaster extends well beyond the base of the horns. Since we do not have access to the bases, it is impossible to tell how large the horns actually were and therefore whether the sheep was wild or domestic. It was clearly a ram, though, and at least reasonably large. It is possible that the plaster head originally stopped at the bases of the horns, and was extended further through replasterings.

A number of dumped or fallen items lay on the floor of Building 77. In Space 336, the main room, along with non-bone objects such as miniature greenstone axes and a pile of peas were a very crumbly cattle frontlet and a pile of antlers. The antlers, burnt and crushed by overlying collapsed construction material, lay in the centre of the floor. Several complete or quasi-complete red deer antlers fell from the ceiling or were dumped here. Just to the east, two horns and the connecting skull of a smallish (female?) cow were also crushed and burnt. A bit further to the east, a burnt, quasi-complete cattle scapula lay on the centre east platform next to a small greenstone axe.

The side room, Space 337, with storage bins at the north end, also has special deposits on the floor, but they are different in character. In the northwest bin, F.3092, a possibly wild male goat horn core, an antler digging tool, and a cattle scapula were placed on the floor of the bin. At least in the case of the horn core, it would have to have been threaded in past the baffle in front of the opening at the base of the bin. Thus, it was not casually dropped or tossed in. The area with the horn core was unburnt, only the tip of the antler tool was charred, and the cattle scapula was heavily burnt. The bins themselves were empty of grain, but outside them to the south is spread of charred cereals. In it was a sizable piece of another (burnt) goat horn core, raising the possibility that goat horns were placed in the bin while it was full, and one stayed behind after it was emptied. The burnt foot of a large raptor was also found in this spread. Somewhat further south, another large raptor foot was clustered on the floor with a few miscellaneous bones: some rib and long bone fragments of large and sheep-size mammals, and a small piece of cattle horn core. Still further south, against the south wall, another cluster contained a third large raptor foot and a complete wild male sheep horn core along with a number of stones. All these items were burned. The three raptor feet, which were spaced 60-70 cm apart, are all from the same, as yet unidentified species, and from the same side; hence, they derive from three different birds. Each was found tightly clustered but not quite in anatomical position, suggesting they may have fallen from the walls or ceiling as they burned. It is interesting that they were not kept or placed as a unit, but spaced along the room.

In the main room of Building 52, a burnt house slightly south of B.77 that also had cattle horn installations, the fill was extremely clean of bone, with little except cattle horn cores and a cattle scapula. Building 77 is not quite so dramatically clean, but there is very little of the usual mixed post-consumption material (primarily sheep/goat) found in most fills. For the most part it is quite clean save for large pieces of large animals, mostly cattle. One of these is a complete, save the very tip, large male aurochs horn core from a dismantled installation (16479.X1). There is some attached skull from the intercornual ridge. It closely resembles the horns on the southern pillar of the northeast platform in size and shape. There are several large chop marks midway up the horn; these make no sense in terms of removing the sheath, and likely were suffered during dismantlement from some installation. We do not have evidence of a dismantled installation in B.77, so it may have been from somewhere in this building or from another one. It lay in the lower fill to the south of the northeast platform with the in situ horns on pillars. There are also many chunks of cattle horn core scattered through the fill in both rooms. So far we have recorded antler chunks, some worked and many not, only from the fill of the side room, Space 337.

Aside from the horns and antler, the bones in the fill are overwhelmingly from meaty parts and complete or in large pieces. Most are from cattle of both sexes and a range of ages. Horse, small equid, boar, dog, and a little sheep/goat are also represented. Eight sizable pieces of cattle scapulae so far recorded may have significance beyond being meaty remains. In addition, a fair amount of human bone is scattered through the fill, burnt in the same way as the animal bone, including a complete scapula. While human bone in ordinary fill might reasonably be considered to be redeposited from disturbed burials, in this generally clean fill its presence may be more deliberate. These meaty hunks are found in both rooms of B.77. Most are burnt along with the fill, but similar pieces are also found in unburnt areas. The sequence of burning and filling seems complex, but these bones must postdate the occupation of the house, but were dumped in prior to or during the burning. They suggest feasting remains associated with house closing ceremonies. If we assume that the bones here represent entire animals consumed, it would have been a huge feast. Even if we discount the possibly curated scapulae, other bones indicate at least three cattle, two equids, and a boar. The amount of antler in this house, both in the fill and in the dump on the floor, is also remarkable.

IST Area

This was the final excavation year for the IST Area. A number of special finds, all from Building 63, were received and analysed by the faunal team (units (13925), (13937), (13932), and (13991)). No other units were analysed.

(13925) is the fill of a bin (Space 284, Feature 2313). The animal bone assemblage consisted of small fragments of sheep-size bones; they were not intentionally placed in the bin. We analysed it because the bin also had three pieces of cattle scapulae (13937) deliberately placed in it. These pieces (13937.X1, 13937.X2, and 13937.X4) were the only bones in the unit and were deliberately placed in the bin along with a pot (see Figures 140 & 141). 13937.X2 and 13937.X4 probably come from the same scapula that broke during or after the excavation. However, 13937.X1 came from a different scapula. The two scapulae are both right sides: thus, they belong to two individuals. One of them is from a young animal. One of the scapula fragments (13937.X4) has a trace of light burning on the proximal articulation. It does not look like intentional burning. The floor of the bin and one side of the pot in it were also burned, but the burning did not affect the rest of the bin. It is not clear whether the partial burning of the bin was intentional or not.

Unit (13932) from Feature 1997 in Space 284 is a bone cluster that consists of a small equid scapula, a partial antler, and a few odd bits of bone from the surrounding fill. The antler probably belonged to a male fallow deer (Dama dama). The scapula was probably almost complete in the ground, although the proximal articulation was not recovered; the antler was only partially present prior to excavation. This bone cluster was deliberately placed below a floor, but its relationship to the floor is not clear. It might have been a commemorative deposit. However, the antler might also have been stored as a raw material.

It is not clear what space (13991) comes from. Faunally, the unit is notable for the presence of a large equid pelvis; it was probably once a nearly complete innominate. The unit also contained a young cattle mandible fragment, and a few bits of mostly sheep-size bones. All the bones were burned, probably in situ, to a high temperature. The equid and cattle remains may derive from a closing feast. It is clear that the equid pelvis was deliberately placed or dumped, and the cattle mandible may also have been deliberately placed. The smaller sheep-size fragments may represent part of the feast, or may simply be miscellaneous bits from the floor.

TP Area
The zooarchaeological examination in 2008 concentrated on study of select bone materials excavated in previous seasons. They come from Spaces 325 (15810) and 326 15261, 15803) of Building 74, as well as Space 320 (15267, 15269) and midden deposit (15222). In total 6429 bone remnants were recorded.

A cluster of stones of similar size (15810) was placed directly on the floor (15809) of Space 325 in Building 74. Many were fragments of (possibly deliberately) broken stone tools and grinding stones. Animal bones were also connected with this cluster, chiefly some cow-size fragments of a probable scapula (15810.X1). The flotation sample includes shaft splinters of sheep-size long bones and ribs. Some pieces are burnt (carbonized, calcined), similarly to some of the stones, which in the north part of the cluster were lying on a very thin layer of ash. A cattle horn core and mandible (15261.X10, 15261.X12) were located directly on the edge of the cluster. It seems that 15810 is a part of an abandonment deposit along with a number of a cattle bones recorded in infill (15261) in Space 326. The special finds from this unit were described last year (Archive Report, 2007). Together with them were found bone fragments, mainly indeterminate.

The rest of the material from this infill deposit is mostly sheep-size fragments, 2-3 cm long shaft splinters, but large pieces are also present: cattle mandible and femur. The range of taxa is great; the bones are good condition show moderate coherence. Three tools, bird bone, human bone, mussel and eggshell were also recorded. Diagnostics come from sheep/goat (horn core, scapula, humerus, radius, ulna, metacarpal, carpal, pelvis, femur, tibia, tarsals, metatarsal, phalanges, skull, maxilla, mandible, teeth - mostly upper), cattle (humerus, metacarpal, carpal, pelvis, femur, phalanx, maxilla, mandible, teeth, including articulated incisors), boar (tooth fragment, tibia, metapodial), fox (tooth, metapodial) and equid (tooth fragment). The sheep:goat ratio is 11:3. Generally sheep-size and cow-size shaft splinters, ribs, and vertebra fragments predominate. Indeterminate pieces of mandible, maxilla, scapula, teeth, skull with marks of digestion and burning (mostly carbonized, but also calcined) are also present. Body part distribution is fairly even. All of these bones (except the sheep/goat and cattle teeth) were fragmented. Teeth of equids and boar are fragmented. Compact bones such as phalanges and carpals are not fragmented, except digested pieces (calcaneus, astragalus, phalanges). The general size range of pieces is 1-4 cm, mostly 2 and 3 cm. There is a range of ages from young (sheep/goat humerus and metapodial, pieces of sheep-size long bones), foetal, infantile, through infantile/juvenile through subadult/ adult. Taphonomically we note a few dismembering cut marks, ca. 15 % burning at mixed low and high temperatures, a very little gnawing, digestion (somewhat more frequent than gnawing), one trampled fragment and very slight-slightly degraded surface condition, with some moderately degraded. There are very heavily worn sheep teeth, indicating advanced age. Overall, the deposit has moderate coherence, a large range of taxa and articulated teeth.

In the eastern part of Building 74, directly on floor (15807) in Space 326, (15803) contains a cattle maxilla (X12) and skull (X13), a cervid antler (X3), and tools (bone points X2, X4, X8, X10). This infill contained many construction elements such as brick fragments. This deposit also filled the doorway in the southern wall of Space 326. The bone assemblage is rich, with mostly sheep-size pieces, some of them trampled. Most specimens are in good condition, with some worked pieces. Along with the mammal bones, there were also bird bones and eggshell, human bones, and mussel shell. Most were sheep-size shaft splinters, with some cow-size and pig-size, and rib and vertebrae pieces. Diagnostic fragments include sheep/goat (horn core, hyoid, scapula, humerus, radius, ulna, metacarpal, pelvis, femur, patella, tibia, tarsals, metatarsal, phalanges, skull, mandible, teeth), goat (phalanx, femur, metacarpal), cattle (femur, phalanx, skull, mandible, teeth, ulnar carpal), boar (tooth, skull, calcaneus), deer (antler), equid (tibia, distal sesamoid), fox (tooth), small carnivore-mustelid (two articulated metatarsals and femur- possibly from one individual). The size range of remnants is 1-7 cm, chiefly 2-3 cm. The high fragmentation made it hard to identify such remnants as tooth fragments, skull, mandible, maxilla, pelvis, scapula to taxon. Some pieces are burnt: a sheep/goat mandible, boar and cattle teeth and cow-size long bones, sheep-size and cow-size ribs (in total about 10 % material) at mixed high and low temperatures. Very few have carnivore gnawing marks or are digested. Bones come from animals in age ranges: young, fetal, infantile, infantile/juvenile, juvenile/subadult, subadult and subadult/adult. Surface condition is generally good, but several fragments have worn surfaces and rounded edges. 11 sheep-size long bones were trampled. There are cut marks on the surface of sheep-size and large mammal ribs, a sheep-size metacarpal (skinning), and a sheep/goat tibia (dismemberment).

A make-up layer (15267) of floor (15268) in the northern part of Space 320 includes mostly sheep-size and cow-size 2-3 cm long shaft splinters and rib fragments. There is no coherence, with trampled pieces but most fragments in generally good condition. Taxa include sheep/goat (horn core, scapula, ulna, tooth, skull), fox (metatarsal), and equid (tooth). All bones except teeth are fragmented. Three pieces of sheep-size long bone are burnt. Some fragments are gnawed (sheep-size shaft splinters), digested, or trampled (fragment of sheep-size rib). Surface condition is good.

A fire installation of unspecified character (15269) in Space 320 below a bricky layer (13020) contained a small animal bone assemblage that has mostly sheep-size and cow-size shaft splinters and indeterminate bones. Diagnostic bones include sheep/goat (scapula, radius, ulna, skull pieces, phalanx III, teeth) and cattle (sesamoid, mandible). All are fragmented except teeth and a sesamoid. The general size range is 1-3 cm, with most ca. 2 cm. Few phalanges are complete due to digestion. Ca. 10% of the bone is burnt: partly carbonized (sheep/goat radius), carbonized (tooth fragments, cow- and sheep-size ribs and long bones), and calcined (sheep- and cow-size shaft splinters). Only a cow-size long bone fragment has carnivore gnaw marks. Very little of the bone is digested. The surface condition of the bones is generally good. There are some trampled pieces of sheep-size long bone. Two bird bones and one human specimen are also present. This unit seems to have multiple origins; that is, it is redeposited material. Originally this unit was interpreted as an oven by the excavators, but there was neither a clear base nor a significant amount of charcoal. Hence, they now think that the fragmented mudbricks originally thought to be the remains of an oven superstructure are actually construction rubble mixed with brownish soil.

Between walls (13088), (13089), and (13093), and under the east part of midden layer (15217), described last year (Archive Report, 2007) was another midden deposit (15222), related to Space 318. This deposit is part of a large midden layer recorded as units (13570), (15217), and (15220). The (15222) faunal assemblage is relatively homogeneous. It contains mostly sheep/goat bones with some cattle and one boar skull fragment. Bird and human bones are also present. All body zones are represented (scapula, humerus, radius, ulna, carpals, metacarpal, pelvis, femur, tibia, metatarsal, phalanx, pieces of skull, maxilla, mandible, teeth). All the bone is fragmented, except carpals, phalanges, and teeth. Long bones (mostly sheep-size) are present as shaft splinters. Half the material is diagnostic (sheep/goat, cattle, boar). Ca. 10% of the bone is burnt, mostly at low temperatures, but there is also some calcined bone. Some carbonized at only one end (similar to unit (13570)). Very few bones have gnawing marks or are digested. Surface condition is reasonably good, with most bones heavily processed. Two cattle teeth are articulated. Sizes range from 1-5 cm, with most ca. 2 cm.

West Mound Trenches 5 and 7

Trench 5

A number of spaces were defined during the 2008 season; including several with relatively secure and undisturbed Chalcolithic fills. Only part of the material from one such fill unit (16898) was processed in time for preliminary assessment during the 2008 season. This unit represents the upper fill of Space 310, overlying (17214). As such, most if not all of the material are likely to be redeposited, and indeed variability in fragmentation, colour and texture points to multiple taphonomic histories. The unit therefore has limited potential for faunal study, but nonetheless gives a first tentative impression of taxonomic composition from a sieved Chalcolithic unit in this area: the portion examined thus far is dominated by caprines and sheep-size specimens, but a surprisingly large number of fragments derive from larger taxa (15-20%; cf. Table 4), including both cattle and equids.

Trench 7

Excavation in this area was restricted to cleaning for photography, but assessments were conducted for a number of units from the 2007 season ((15104), (15107), (15109), (15111), (15112), (15113), (15115), (15126), (15129), (15131), (15132), (15133), and (15135)). Full recording was not undertaken due to the arbitrary nature of most units and the lack of sieving. Taxonomic compositions must be treated with caution since hand-collection favours larger taxa, but diagnostic zones (DZ) are typically less subject to recovery bias than fragment counts. Table 4 compares total DZ counts by taxon from Trench 7 with those from Building 25 (1998-2003 West Mound excavations – see Gibson et al. 2004). Taking recovery bias and small sample size into account, the Trench 7 figures can be considered consistent with the earlier results.

An anomaly is presented by (15111). This arbitrary unit included only 19 specimens, the majority of which belong to three dog limbs, probably from the same individual and not included in Table 4. Two forelimbs (scapula to radius/ulna) are clearly paired, while an articulated left femur and proximal tibia match them in size and maturity. Since the bones were not noted in situ, it is hard to say whether they were still articulated at the point of deposition. Burning noted across the knee joint must have occurred prior to complete disarticulation – suggesting roasting – yet took place after the tibia shaft was broken and may have been post-depositional. Interpretation as a burial per se is militated against by the exclusive presence of long bones, and by cut marks around several of the articulations. A more plausible explanation involves the deposition of partially articulated remains in a single event following defleshing and/or consumption.

*Table 4: Diagnostic Zone (DZ) counts for Trench 7, compared with figures for Building 25 (Frame 2004). *Dog deposit from (15111) is excluded.*

	Trench 7		Building 25	
	DZ	**%DZ**	**DZ**	**%DZ**
Sheep/goat	133	*85.42*	1432.5	*91.50*
Cattle	16.5	*10.60*	77	*4.92*
Roe deer	0	*0.00*	4	*0.26*
Red deer	0	*0.00*	4.5	*0.29*
Pig	1	*0.64*	2.5	*0.16*
Dog*	3.2	*2.06*	13	*0.83*
Equid	2	*1.28*	32	*2.04*
TOTAL	**155.7**		**1565.5**	

Conclusion

For the most part, this year's work has continued to fill in data on the later (post-VI) levels in preparation for the coming study seasons and analysis. One high point is the midden sequence that can be tied to the Building 44/56/65 sequence. This association will permit sophisticated analysis of the consumption practices in those houses, as well as close dating. These middens are also filling in a gap in the sequence between Level V-VI in the 4040 Area and Levels III-I in the TP Area, in Mellaart's phasing system. Another exciting focus of analysis is Building 77, a well-preserved burnt building in the 4040 Area excavated and partially analysed this year. This house has in situ installations, abandonment deposits, and feasting material dumped in the fill, possibly while the house was burning.

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Research Projects

Herding practices in Neolithic Çatalhöyük, Central Anatolia: the use of oxygen isotopes and microwear in sheep teeth - Elizabeth Henton.

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Abstract

As early herding intensified, Neolithic societies might have broadened their resource base through tightly scheduled manipulation of sheep breeding, movement and feeding behaviour, introduced to facilitate seasonal distant-pasturing and access to domestic crop by-products. The long-term success of early herders in Neolithic Çatalhöyük, Central Anatolia, offers a case-study for investigating chronological change.

This research uses direct evidence of the environmental conditions in which sheep were raised. Oxygen isotope evidence in sheep tooth enamel tests for seasonal patterns in breeding and mobility, and dental microwear analysis tests for variety in seasonal feeding regimes. Preliminary analysis of a small part of the data set gives interesting indications of data patterning and the potential interpretative power of the methodologies.

Background

This report describes the progress made during the second year of PhD research and summarises trends emerging from the data. The key research interest is the intensification of early domestic herd animal exploitation in Western Asia, and the changing place of herders within society. The research explores ways in which Neolithic societies might have broadened their resource base through tightly scheduled manipulation of sheep breeding, movement and feeding behaviour, introduced to facilitate seasonal distant-pasturing and access to domestic crop by-products.

The research aim is to build individual life histories for archaeological sheep, providing evidence of birth season, pasturing location during the first year, an indication of general diet throughout life, the specific feeding regime in the weeks before death, and concluding with a suggested season and age of death. These life-histories establish the variety of ways in which sheep were reared, and when taken together, and diachronically, model some of the herding practices in place. It is then possible to discuss the yearly schedules of the herders, their movement from and to the settlement, and their relationship with arable farmers.

The long-term success of early herders in Neolithic Çatalhöyük, Central Anatolia, offers a case-study for investigating chronological changes in practice. Unlike many Levantine settlements, which collapsed by the end of the PPNB (Rollefson & Köhler-Rollefson 1989), Çatalhöyük continued to grow (Cessford 2005) despite possible competition for land (Rosen &Roberts 2005, Doherty 2007) between herders of domestic caprines (Russell & Martin 2005) and farmers of domestic crops (Fairbairn et al. 2005). Evidence from carbon and nitrogen isotopes in bone (Richards et al. 2003; Pearson et al. 2007), charred dung and penning deposits (Matthews 2005) and charred plant remains on site (Asouti 2005) suggest widening resource exploitation; it is possible that herders had found distant pasturing solutions.

The methodology and the evidence

In order to study variety in herding practices it is necessary to provide direct evidence of the environmental conditions in which sheep were raised. This research uses two techniques that have recently been applied to animal remains from archaeological sites: oxygen isotopes (e.g. Balasse & Ambrose 2002) and dental microwear analysis (e.g. Mainland & Halstead 2002). Applied to dental remains of domestic sheep, oxygen isotope evidence tests for seasonal patterns in breeding and mobility, and dental microwear analysis tests for variety in seasonal feeding regimes. Taken in tandem with other zooarchaeological and palaeoenvironment evidence, they combine to give an integrated picture of the animals' breeding, feeding and movement regime. The regimes may be compared to those that are physiologically optimal to sheep, and thus the success of herders' decision making may be assessed and discussed.

Sampling and taphonomy
Teeth survive well in the Çatalhöyük archaeological record; tests undertaken in the pilot study of this research establish the diagenesis of enamel carbonates to be minimal and the dental microwear to be easily distinguishable from taphonomic wear. The study is restricted to sheep; it uses 2nd mandibular molars that contain an oxygen isotopic record of the first year of life (Hillson 2005) and are suitably in wear for dental microwear analysis.

The criteria outlined above limits the number of suitable samples and by the end of the 2008 season all 70 suitable jaws have been exported. Of these 45 are from middens where chronological resolution is more secure, and will provide the backbone of interpretation; the remaining teeth will be useful for more general analysis. The implications to this research of the newly introduced phasing system have yet to be studied.

In addition, nine modern sheep teeth, taken from sheep raised traditionally in three local farms at different altitudes and with different microclimates have been exported this summer. Seasonal dung, food and water samples associated with the pasturing history of these sheep were collected by the farmers over the last year and have also been exported. These will test the feasibility of archaeological application of the methodologies and provide a local baseline comparator.

Figure 99: (left) A second mandibular sheep molar showing sequential bands of enamel removed for oxygen isotope analysis. (right). An S.E.M. image of the occlusal surface of the same tooth, showing dental microwear.
Photo Elizabeth Henton

Preliminary results and interpretation
In 2007, the pilot study on ten teeth confirmed that the archaeological teeth provided oxygen isotope data that allowed both seasonal and regional discrimination, and dental microwear that discriminated between different foodstuffs. In 2008 a further 17 archaeological teeth were analysed, and now interesting indications of data patterning and the potential interpretative power of each methodology emerge.

Throughout the occupation a general trend in maximum oxygen isotope values may be indicative of summers becoming more humid or of herds being moved progressively further uphill away from the plains in summer. Certainly the modern data confirm that it is possible to discriminate the effects of uphill cooling on isotopic values in sheep tooth enamel. Up to Level V there is a wide variation in values and in seasonal patterns, but these become markedly more clustered in later levels; possibly a settlement-wide consistency in herding practice was emerging.

Dental microwear analysis shows that throughout the occupation the final feeding regimes of the sheep fall into two groups; one grass rich, the other not. This might indicate two slaughtering seasons or two different herding practices at the settlement. Closer analysis of the microwear features indicates a chronological change in the grass-poor diets. Those in pre-Level VII sheep were rich in woody browse, whereas those from later level sheep were rich in softer material such as field-edge weeds or chaff. If this is so, then a more nutritious diet is indicated in the later occupation levels.

Summary
This report presents work very much in progress and attempts neither a synthesis of the results nor an interpretation. Nevertheless the partial results and preliminary analysis show that interesting but complex trends are emerging, and that the evidence has the potential to approach the key research interests and aims. I am happy to discuss my results in more detail and may be contacted at e.henton@ucl.ac.uk .

Acknowledgements
This research has been funded by AHRC, NERC, UCL and IOA. I wish to thank the Çatalhöyük Research Project and its Faunal Team for allowing me access to their archive, the Aşıklı Research Project for its support and hospitality, and the farmers for collecting all modern samples throughout the year. In addition I thank everyone in the QUB, NIGL and Stanford stable isotope laboratories.

I am indebted to Ian Hodder, Shahina Farid and Banu Aydınoğlugil for their support, to Louise Martin, Ken Thomas and Ingrid Mainland for their supervision.

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Çatalhöyük Worked Bone 2008 - Nerissa Russell

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Abstract
I recorded 298 bone artefacts in 2008, bringing the cumulative total to 2433. This included tools excavated this year, of which all that reached me before my departure were recorded, and some backlogged material from previous years. This year's work confirms that tool types change somewhat starting ca. Level VI, with the appearance of knucklebones and new, more elaborate bead types.

Introduction
During the 2008 season I recorded 298 bone artefacts from backlog and this year's excavations, bringing the total recorded to 2433. The cumulative distribution of tool types by excavation area is given in Table 5, not including 8 tools recorded from the on-site KOPAL step trench (KT), one stray tool from the surface scraping that appeared in 2004, and 20 unstratified or post-Chalcolithic artifacts. The text discusses the tools recorded in 2008.

Tool Types
Points
As usual, points are the most frequent type of bone artefact, with 88 recorded in 2008. Abraded bases were rare in the earlier levels of the site, but become more common after ca. Level VI. This year their proportion rose to 61% of those recorded. These points result from a different manufacturing technique in which abrasion produces both the splitting and the roughed-out base form. In earlier levels the points were generally split first and then shaped. The abrasion technique works best with metapodials, taking advantage of their double-tubular structure. It is therefore not surprising that 78% of the points recorded this for which the element could be determined are made on metapodials.

Rounded Points
Two rather similar rounded points were recovered this year, both probably used as hairpins or for a similarly ornamental function. 13532.X28 from the TP area is missing the tip end (although present in the ground), so we cannot be sure it is a rounded point, but this seems highly likely be analogy with similar objects. Carved from large mammal long bone cortex, the shaft is round, while the base is slightly flattened and incised into a five-digit hand or flower shape. Most of the incisions are on one side only, but the two lower 'digits' are incised from both sides. 16262.F1 is complete and similar in shape. Its base is incised in a pattern that

Figure 100: Rounded points, perhaps to secure clothing or hair, made of large mammal long bone cortex: 16262,F1, two views, top; 13532.X28 two views, bottom.

evokes a flower or leaf, or perhaps glume wheat; it is set off from the shaft by a strangulating groove.

Needles
All the 'needles' recorded this year are the usual broad, flat type with flat rounded tips, made on split ribs. They are probably actually weaving or netting tools. The same pattern seen last year continued this season: none are from the latest levels of the East Mound (TP area), but there is now a second crude example from the West Mound. Moreover, those from the East Mound tend to the narrow end.

Picks
Two picks were recorded this year: tools used with a striking motion. This is a rare tool type at Çatalhöyük, although fairly common in much of Neolithic Europe. 16488.X3 is an apparently unmodified antler tine (probably fallow deer) shows a combination of deep troughs and gouges and fine striations that indicate use in soil or perhaps construction material. The microwear shows a striking motion followed by some twisting. It was found in Building 77, and may have been used in the dismantling (if any) of the building or its installations, or to dig out building materials used in its construction and remodelling. The tip has been hardened, perhaps deliberately, by slight burning, but the base end has crumbled away. From Trench 8 on the West Mound, 15577.X2 is the tip end of a tool on a sheep/goat tibia shaft with a break forming a rounded bevel. It has been used, perhaps without any shaping, in a striking motion on some fine-grained material such as fine-tempered clay. Unlike the beveled, shaft-hole antler picks of Neolithic Europe, both of these are very expedient tools.

Chisels/Gouges
One of this year's two chisels comes from the Space 319 midden in the South Area (16534.F16). Typically for Çatalhöyük, it is made on an unsplit distal sheep/goat tibia. The tip was abraded to form a bevel and later scraped to resharpen or repair it. It shows massive flaking indicating that it was struck; however, the base, which has been abraded to flatten the high points of the distal articulation, shows some wear but not impact scars. It must have been hafted or wrapped when struck. The tip of a chisel was found in Trench 7 on the West Mound (15109.F6). It is also made on a sheep/goat long bone but may be a radius rather than the usual tibia. The tip was ground to a rounded bevel and shows substantial chipping from use, although not as dramatically as 16534.F16.

Scrapers
The tip fragment of a tool of the same shape as the chisel/gouges but with wear indicating use as a scraper on soft substances (hide?) was also recovered from Space 319.

Pressure Flakers
One possible pressure flaker comes from Building 77 in the 4040 Area. It is a large antler tine with some ambiguous wear that may be from flaking, although it may be incidental damage to an object that was part of either a dismantled installation or a raw material store. Another antler tine from nearby Building 49 has much clearer microwear, indicating use as a pressure flaker near the tip, and as a soft hammer on the base and shaft when turned around and held in the other direction.

Soft Hammer
From the same area in Building 49, another antler tine, without modification, was used as a soft hammer (14460.X2). Again, it was used at both ends, with one involving heavier striking than the other. This tool was deposit bound with crisscrossed sedge twine that seems to hold on ears of barley; this makes little sense in terms of its use, so was presumably a special act linked to its discard/placement.

Pottery Polishers
Pottery polishers continue to be relatively common this year, with 10 examples although two may be from the same tool. All but one are on pig- or cow-size ribs, split or unsplit, and all were used on fine-tempered ceramics. One is from the South Area, four from 4040, and the rest from the West Mound: three from Trench 8, two from Trench 7.

Burnishers
A further fragment of a split rib tool from Trench 7 on the West Mound appears to be a burnisher, but there is too little wear to tell is if it is for pottery or some other material. From Trench 8 comes one of the expedient burnishers with flat rounded tips, several of which were found last year on the West Mound. But while most of these were used on pottery, the polish on this tool (15571.F1) indicates use on leather.

Plaster Tools
Two fragments of scapula plaster tools were recorded this year, one from a probable feasting deposit in the 4040 Area (13107.F121), the other from a midden-filled pit in the South Area (15759.F54).

Hafts/Handles
Three antler hafts were recorded in 2008. 16523.X8 from Building 75 in the South Area is a very unusual tool for Çatalhöyük: a sleeve made on the base of a very large shed red deer antler (Figure 101). The beam and brow tines were removed by cut-and-break, the burr was trimmed off, and a ca. 3 cm deep hole cut into the stub of the beam to hold something like a stone axe. The sleeve would then have been bound to a wooden handle. Two simple antler hafts for smaller tools, which would be hand-held, were recorded from Trenches 5 and 7 on the West Mound.

Figure 101: Large antler sleeve: 16523.X8, two views. Photo Fauna Team

Spoons
Two spoon fragments, one base and one bowl (from different objects), were recorded from the IST area. The base fragment (12451.X1) has a knob at the end set off by double notches on the sides. The tip fragment (13918.X2) has a broad, flat blade meeting a shaft with a circular cross-section.

Spatulae
16260.X1 is the base of a spatula from a Space 319 midden in the South area. Made on a split large mammal rib, the shaft is flat, while the base end broadens into a rounded shape.

Knucklebones
I completed the recording of the worked astragali from a deposit excavated in 2006 in Building 67 in the 4040 Area with large numbers of sheep and goat astragali and small, round, black and white stones. This adds 79 to the total. In addition, two were found in the Space 319 middens in the South Area.

Pendants
Two pendants were recorded in 2008, both from backlogged units of midden material from the 4040 area. 14132.X12 has a simple rounded rectangular shape, made on split large mammal long bone shaft. 13103.F2 has a shape unlike any previously found. The lower part is nearly spherical, and the top flat and peaked, set off by slight grooves. This object is right at the limit of the thickness of an object that can be made from solid bone. It is made on the proximal end of an aurochs metacarpal, with the bottom reaching nearly to the articular surface and the upper part running down the proximal shaft. It is a consummate piece of craftsmanship

Figure 102: (Left) Pendant fragment: 14132.X12 (Right) Spherical pendant: 13103.F2.

Beads

Figure 103: Badger tooth bead: 8806.F1, three views. Photo Fauna Team

I recorded 55 beads in 2008, many from backlog. They cover a wide range of types (see Table4), with an unusual number of worked carnivore teeth. Two from the South Area are from unidentified small carnivores; most are abraded and pierced badger teeth from five burials excavated in 2003 in the 4040 Area (Figure 103). Four are close together and somewhat disturbed by later burials and their proximity to the present mound surface, but one is separated by ca. 25 meters. Thus at least two burials must have had necklaces with these distinctive beads.

There are four beads that are more or less flat disks, a form usually seen in stone, although some resemble tiny stylized red deer canine beads. Other odd beads include a stylized interlocking bead from the South Area that is so flat it could not actually interlock. One of the tubular beads from the 4040 Area is not made in the usual way by cutting a segment from a fox, hare, or bird long bone: it is made on a piece of split large mammal long bone cortex abraded into shape, taking advantage of a nutrient foramen for the longitudinal perforation.

Rings

Rings continue to be scarce in these later levels, with only three fragments, all from the 4040 Area.

Preforms and Waste

Eight point preforms were recorded in 2008, all from the South and 4040 Areas. One was nearly finished and appeared to be roughed out by unassisted fracture. Two have remnants of the groove-and-split technique, in which a groove in incised down the centre of a metapodial, usually on both anterior and posterior, and then split by striking with a chisel or similar tool. Five point preforms evidence manufacture by abrasion, where the anterior and posterior of metapodials are heavily abraded until the marrow cavity is exposed.

Other preforms consist of two roughouts for fake red deer canine beads, both from the South Area, and two antler pieces extracted by a combination of cut-and-break and groove-and-splinter (one each from the South and 4040 Areas). Additionally, two pieces of antler with traces of cut-and-break appear to be waste, from the South and IST Areas.

Indeterminate

Figure 104: Sheep ulna tool: 16235.F61.

Eight tools could not be assigned to a type in 2008. Three were simply too fragmentary to tell. Two and probably a third are bars of split antler beam that seem finished but whose function is unclear. One long bone fragment (16534.F3) from the Space 319 middens in the South Area has been carefully fractured but not abraded to produce regular edges, and abraded to form a rounded, slightly flattened tip, which seems to have been used with a crushing or pressing motion. Also from the South Area, 16235.F61 is a robust sheep ulna whose shaft has been scraped to form a somewhat flat, rounded tip (Figure 104). It has been used with a sideways or twisting motion on a soft material. It is not clear what the task would be, as it is too dull to pierce effectively, and seems small to use as a burnisher.

Discussion

The worked bone recorded in 2008 supports the emerging pattern of shifts in some tool types in the later levels (roughly after Level VI). Knucklebones become prominent, beads become more varied and elaborate, and pottery polishers much more frequent, while rings become rare. Points are increasingly made by abrasion, and perhaps groove-and-split, rather than simple fracture.

Table 5: Tool Types by excavation Area, cumulative

# Column %	South/ Summit	North	KOPAL	IST	BACH	TP	4040	West	Total
Point	448 47.6%	39 40.6%	2 50.0%	65 55.1%	77 41.0%	75 55.1%	288 36.4%	67 51.5%	1061 44.1%
Rounded point	5 0.5%	2 2.1%	0	1 0.8%	2 1.1%	2 1.5%	8 1.0%	0	20 0.8%
Blunted point	1 0.1%	0	0	3 2.5%	0	0	1 0.1%	0	5 0.2%
Needle	73 7.8%	5 5.2%	0	0	18 9.6%	1 0.7%	39 4.9%	2 1.5%	138 5.7%
Harpoon	1 0.1%	0	0	0	0	0	0	0	1 0.04%
Pick	1 0.1%	0	1 25.0%	0	0	0	1 0.1%	2 1.5%	5 0.2%
Hammer	1 0.1%	1 1.0%	0	0	0	0	1 0.1%	0	3 0.1%
Pounder	0	0	0	0	0	0	0	1 0.8%	1 0.04%
Chisel/gouge	15 1.6%	0	0	11 9.3%	0	2 1.5%	6 0.8%	4 3.1%	38 1.6%
Chopper	0	0	0	0	1 0.5%	0	0	0	1 0.04%
Scraper	6 0.6%	0	0	1 0.8%	0	1 0.7%	2 0.3%	3 2.3%	13 0.5%
Punch	1 0.1%	0	0	0	0	0	0	0	1 0.04%
Pressure flaker	6 0.6%	0	0	0	1 0.5%	0	9 1.1%	0	16 0.7%
Soft hammer	4 0.4%	2 2.1%	0	0	0	0	1 0.1%	0	7 0.3%
Pottery polisher	12 1.3%	0	0	1 0.8%	4 2.1%	5 3.7%	11 1.4%	12 9.2%	45 1.9%
Burnisher	4 0.4%	0	0	1 0.8%	0	4 2.9%	6 0.8%	3 2.3%	18 0.7%
Plaster tool	11 1.2%	6 6.3%	0	0	0	1 0.7%	2 0.3%	2 1.5%	22 0.9%
Haft/handle	2 0.2%	0	0	1 0.8%	2 1.1%	1 0.7%	0	7 5.4%	13 0.5%
Fishhook	6 0.6%	3 3.1%	0	0	2 1.1%	0	1 0.1%	0	12 0.5%
Spoon	1 0.1%	1 1.0%	0	2 1.7%	0	1 0.7%	3 0.4%	0	8 0.3%
Spatula	6 0.6%	0	0	8 6.8%	1 0.5%	3 2.2%	6 0.8%	0	24 1.0%
Bowl/cup	2 0.2%	0	0	0	0	0	0	0	2 0.1%
Knucklebone	8 0.9%	0	0	3 2.5%	0	11 8.1%	133 16.8%	3 2.3%	158 6.6%
Ornament	11 1.2%	0	0	0	0	2 1.5%	6 0.8%	2 1.5%	21 0.9%

# Column %	South/ Summit	North	KOPAL	IST	BACH	TP	4040	West	Total
Pendant	15 1.6%	6 6.3%	0	0	3 1.6%	1 0.7%	7 0.9%	0	32 1.3%
Bead	94 10.0%	6 6.3%	0	1 0.8%	10 5.3%	3 2.2%	189 23.9%	3 2.3%	306 12.7%
Ring	55 5.8%	15 15.6	0	0	33 17.6%	4 2.9%	9 1.1%	1 0.8%	117 4.9%
Belt hook/eye	2 0.2%	0	0	1 0.8%	2 1.1%	0	3 0.4%	0	8 0.3%
Collar	6 0.6%	0	0	1 0.8%	0	0	2 0.3%	0	9 0.4%
Preform/ Waste	79 8.4%	3 3.1%	1 25.0%	2 1.7%	20 10.6%	8 5.9%	20 2.5%	3 2.3%	136 5.7%
Indeterminate	65 6.9%	7 7.3%	0	16 13.6%	12 6.4%	11 8.1%	37 4.7%	15 11.5%	163 6.8%
Total	941	96	4	118	188	136	791	130	2404

Table 6: Bead Types Recorded in 2008 by Area

Type	South	4040	West Trench 8
Interlocking	3	8	
Carnivore tooth	2	20	
Red deer canine	1	1	
Fake red deer canine	5	3	
Tubular	2	4	
Disk	1	3	
Double-ended		1	
'Cufflink'			1

Human Remains Archive Report 2008 - Lori Hager & Başak Boz

Team: Simon Hillson *(1)*, Başak Boz (2) Lori Hager *(3)*, Brenna Hassett *(1)*, Helen Lomas *(1)* with help from Ramazan Gündüz*, Derya Bölük*, Ayşegül Tabakoğlu*, Numan Aslan*, Utku Yalçın*, Görkem İlarslan*, Onur Yüksel* Dilek Çekiç*

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The main aim this year was to re-inventory the skeletal collection for database purposes in preparation for the upcoming study seasons. We managed to re-inventory almost 300 skeletons. In addition, the team was involved in the excavation and processing of the new skeletal remains recovered from nearly all the areas of the site under excavation this season: the 4040, South, Team Poznan (TP), and Istanbul (IST) Areas on the East Mound and Trenches 5 and 7 on the West Mound. These included at least 41 Neolithic burials, one Chalcolithic burial, and four Post-Neolithic ones. The Istanbul team recovered the first Neolithic burials from their area, two infants in the same room. The West Mound team found their first Chalcolithic burial this season, also an infant. Three Post-Neolithic individuals were recovered from the 4040 Area and one from the West Mound.

4040 Area
Building 49, Spaces 100 and 335
The northern platforms in B.49 had 14 people buried in the two platforms. The North-East platform (F.1664) was used for the interment of five children ranging in age from a newborn to a child of 11-13 years. None of the children had been disturbed. The North-West platform (F.1651) was used to bury nine individuals, including both children and adults. The majority of these skeletons were disturbed, including six, which were headless. In 2006, the excavation

of the upper levels of the house revealed a single grave in the central floor containing the torso of an older individual (F.1492 (13609)). The total number of burials in B. 49 is 15.

NE Platform (F.1664)
Occupying the northeast corner of the house, five children were sequentially buried into this platform. Four floors had been cut to accommodate the five children. The graves of two children were cut into the same floors in different locations in the platform. Each grave cut was distinct and clear. Given the size of the platform and the number of graves dug into it, it is remarkable that none of the grave cuts from later burial events disturbed the earlier ones. One factor contributing to this is the small size of the grave relative to the skeletons. This resulted in nearly all of the skeletons fitting tightly within their graves. One individual (16601), the oldest and last child to be buried in the platform, was exceptionally compressed to fit into the grave. One child was buried close to a post-retrieval pit, resulting in disturbance to its head and arm sometime during the Neolithic. Otherwise the remaining skeletons were intact. No grave goods were found in direct association with the children. One child (16660) was associated with yellow residue.

Descriptions of Burials in NE Platform [first interment event to last]
F.4015 (16660)
The first individual buried into the NE platform was a child of 3-5 years (Figure 105). Placed on its left side, the body was tightly flexed at the hips but loosely flexed at the knees. The head was oriented to south and the feet to north. A patch of yellow residue mixed with phytoliths was found near the hip region. Black staining of the bones was evident throughout the skeleton. The eastern edge of the grave cut was not visible due to its partial disturbance by the western edge of the grave cut of a later child (16638) although no bones were disturbed.


Figure 105: First child (16660) buried in NE platform of B.49, yellow residue near hips, view to west.

F.4014 (16641)
Placed on its right side, the child of 8-9 years was oriented with the head to south and the feet to north. The body was tightly flexed at the hips and knees. The right side of the head and the right elbow under it was disturbed due to the proximity of this part of the skeleton to a post-retrieval pit. The grave cut for (16641) was distinct. The cut was made into the same floor as another child (16638). This suggests interment of these two individuals occurred at or near the same time.

F.4013 (16638)
Oriented with the head to the south and the feet to north, this child of 8-9 years was placed into the small grave in a tightly flexed position (Figure 106). The upper body was turned onto the stomach while the lower body was on its left side. The face was down. The clear grave cut was made into the same floor as another child (16641), suggesting these children were buried close together in time. Phytoliths were noted on the head. Black staining was observed throughout the skeleton.


Figure 106: Child (16638) buried in NE platform of B.4, note tight fit within the grave pit, view to west.

F.4012 (16627)
The flexed skeleton of a newborn was found at the western edge of the platform near the platform lip abutting the northwest platform. The neonate was

oriented in northwest-southeast with the head to the northwest. The body was on its stomach with feet drawn under it. Animal disturbance was noted in the immediate area of the skeleton. The grave cut was distinct in the platform floor.

F.4011 (16601)
The last child to be buried in the NE platform was also the oldest one. This individual was 11-13 years old at the time of death. Oriented with the upper body to the west and the feet to the east, the skeleton was tightly flexed at the neck, hips, and knees (Figure 107). The head was face down. Turned acutely at the neck, the head was oriented to the south while the main axis of the body was oriented west-east. The torso was turned onto the stomach while the lower body was on the right side. The skeleton was tightly constrained within the small grave.

Figure 107: Last burial in NE platform in B.49, an adolescent (16601), note tight fit within the grave, view to north.

Black staining was observed throughout the skeleton. One greenstone bead was found in the associated burial fill and phytoliths were noted in the cranial area. Plaster was noted on the legs and feet in varying degrees of concentration. A few construction materials were noted in the upper levels of the grave fill near the feet. The grave cut was clear and distinct. It overlaid the northern part of the grave of another child (16638) but did not disturb it.

Sequence of Burials Events in the NE Platform
The interments of the five children in the NE platform occurred as follows:
F.4015 (16660): first burial in the platform
F.4014 (16641): next one buried, at/or near same time as (16638)
F.4013 (16638): next one buried, at/or near same time as (16641)
F.4012 (16627): next to last one buried in the platform
F.4011 (16601): last burial in the platform

NW Platform (F.1651)
Nine individuals were buried in the NW platform of Building 49. Disturbance of earlier burials by later ones was common. Six of nine skeletons were disturbed; all of these six were headless. The removal of the head was clearly the intent with two individuals (16697, 16698) whose bodies were otherwise fully articulated. In addition to being headless, four individuals were also missing other skeletal elements. Some of the disturbed elements were found in the burial pit but many were not. This suggests that many bones were removed from the NW platform and placed in a secondary context elsewhere. Grave cuts or parts of the cuts were visible for many but not all of the individuals due to the overlap of cuts in the central areas of the platform.

Four individuals in the NW platform were children and five were adults. The youngest individual, an infant and one of the first to be buried in the platform, had several grave goods associated directly with it. The last individual buried in the NW platform, an undisturbed adult female, also had grave goods in direct association with her. Grave goods were absent for the other burials in the platform. Residues were noted for several individuals and included black and yellow residues.

Descriptions of Burials in NW Platform [first event to last event]
F.4023 (17457)
The first individual buried in the NW platform was an infant. The baby skeleton and related grave goods were mostly intact at the bottom of the cut (Figure 108). The top of the grave cut

Figure 108. First burial in NW platform in B.49, an infant (17457) with grave goods, view to west.

Figure 109:. Close-up of grave goods found in association with the infant (17457).

was removed by later grave cuts. The child was in a flexed position on its left side oriented west to east with the head to the west. Phytoliths under the skeleton and on the shoulder were present, suggesting the body had been placed on or wrapped in a mat. A brown residue, possibly leather, and a yellow residue, possibly ochre, were sampled from different areas around the skeleton. The many grave goods directly associated with the infant included a shell bead necklace, a rolled copper tubular collar, a bead anklet of black, white and pink stones, several shells, a bone spatula, flint, textile, and blue and red pigments (Figure 109). Three twisted threads were preserved within the rolled copper collar and a nearby fragment of textile was also preserved through the corrosion of the copper (see Farid, Woven & Twisted Fibres this report). A dark staining around these items suggest that several of these items may have been originally placed in a leather pouch at interment. This was an exciting find since as the first example since the 1960s excavations of a well-made, folded copper necklace with string and textile associated with it.

F.4024 (17485)
This intact skeleton was an adult male. The grave cut was clear and distinct in the northwest corner of the platform. The tightly flexed body was on its right side, oriented with the head to the west and feet to the east. The head was facing southeast. Yellow ochre was placed by the left shoulder in a basket or small mat as evidenced by the presence of phytoliths with the residue. Additional concentrations of yellow residue were located under the chest. A shell was found indirectly associated with the male. Black residue was noted in the chest area.

Figure 110: Headless adult (16697) in NW platform in B.49, head of infant (17457) and associated beads under the adult; hand and legs of another adult (17485) to right, view to west.

F.4021 (16697)
The nearly complete skeleton of an older adult female was found in the central part of the burial pit (Figure 110). The headless body was oriented west-east with upper spine to the west and the feet to the east. No neck vertebrae were present. The taking of the head could have occurred during the interment of other individuals into the pit. It is

also possible the head was taken during a non-interment event. The laterally compressed upper body was on its stomach; the legs were on the left side. Black residue was evident in the thorax and shoulder regions. The feet of this female were under the legs of another adult (17485), suggesting this individual (16697) was buried before (17485). The skeleton of (16697) was immediately above an infant (17457) and north of a juvenile (16698). A disturbed skeleton (17412) was found in a higher level to the north (see Figure 112).

F.4022 (16698)
The nearly complete skeleton of a child, 4-6 years of age, was found in the southern part of the NW platform (Figure 111). The grave cut was distinct on three sides but it was truncated on its northern edge by other grave cuts. The flexed, articulated skeleton was headless but otherwise it was intact. Oriented east-west with the upper body pointing to the west and the feet to the east, the upper body was on the left side while the torso was on slightly its front. The neck was flexed so that the head would have been pointing to the north. Phytoliths were found in the pelvis and thorax regions. The taking of the head of this individual may be related to the interment of the older adult female (16697) or to a non-interment event.

Figure 111: Headless juvenile (16698) in NW platform in B.49, view to north

F.4021 (17412)
An articulated torso of an adult, possibly male, was found in the northwest part of the platform (Figure 112). The skeleton was missing the head and most of the shoulders and upper thorax bones. Some of these were found in displaced positions. The lower limb bones were also missing. The individual was on its back with the hips turned slightly onto the right side. It is likely the upper body was disturbed during the interment of the juvenile (14438) and the lower body disturbed during the interment of the adult female (16697) and/or the interment of the adult female (14441). It is also possible the missing body parts were retrieved during a non-interment event.

Figure 112: NW platform in B.49 with skeletons at various levels of excavation: torso of disturbed burial (17412) in foreground, headless individual (16697) in centre, and juvenile (16698) in background, view to south.

F.4019 (17403)
The burial consisted of disarticulated feet and hand bones of an adult. The grave cut was clearly defined in the NE corner of the platform but only a small amount of the grave fill and skeleton remained in situ. The skeleton may have been disturbed during the interment of the adult female (14441), and may actually be the same as another disturbed individual (17412) found to the west.

F.4009 (14438)
The pelvis, legs, and feet of a juvenile aged 7-9 years were found in the northwest corner of the NW platform. The upper body above the hips was missing. The legs were loosely flexed at the knees, which angled upward, representing the highest level of the burial. The feet were flexed against the edge of the grave cut. The body was probably on its back and the head

may have been oriented to the south. The skeleton was probably disturbed by the interment of the adult female (14441) while its interment likely disturbed an adult (17412).

F.4000 (14440)
The partial skeleton of an infant aged 3-6 months was found near the intact adult female (14441). The infant was represented by right and left ribs only. The infant may have been disturbed at the time of the burial of the adult female. A greenstone axe was found in the burial fill surrounding the infant (14440) and the adult female (14441).

F.4000 (14441)
The last individual buried in the NW platform was an adult female in her 30s-40s at the time of death (Figure 113). The skeleton was intact with the head to the west and the feet to the east. The flexed body was placed on its left side, face down. A necklace of black beads was found around her neck. Plaster was found in high concentrations on the right hand, both legs, and both feet. A yellow residue lay under the torso and pelvic areas. Black residue was found in the thorax region and phytoliths were found on the skull. As stated above, a greenstone axe was found in the burial fill surrounding both the infant (14440) and the adult female (14441). The interment of this individual (14441) likely disturbed other skeletons already in the pit (e.g., 14440, 16697, 17412, and 17403). After this female was buried in the NW platform, no further interments took place there.

Figure 113:. NW Platform in B.49 from above, last burial of an adult female (14441) in situ with infant ribs (14440) in foreground, view to south

Sequence of Burials Events in the NW Platform
The interment of the nine individuals in the NW platform was more complicated than what occurred in the NE platform, mainly in terms of the level of disturbance to earlier burials. Only three of the nine individuals were intact. All disturbed burials are lacking their heads. Four individuals are also lacking some postcranial elements. Based on the sequence of grave cuts into the platform floors and the positions of the skeletons relative to each other, the sequence of burial events is as follows:

F.4023 (17457): first individual to be buried in the NW platform, intact
F.4021 (16697): one of earlier burials, disturbed, headless
F.4024 (17485): one of earlier burials, intact
F.4022 (16698): one of earlier burials, disturbed, headless
F.4021 (17412): disturbed; headless, plus missing postcranial elements
F.4019 (17403): disturbed, headless, plus missing postcranial elements
F.4009 (14438): disturbed, headless, plus missing postcranial elements
F.4000 (14440): disturbed, headless, plus missing postcranial elements
F.4000 (14441): last individual to be buried in the NW platform, intact

4040 Area
Spaces 83, 84, and 92
Nine Neolithic individuals were found near the surface in Spaces 83 and 84. These graves were made into the lower levels of the buildings which once stood above the present surface level and are no longer present. The context of these burials is therefore not clear. Three

adult females, one adult male, and five juveniles were located in these spaces. In Space 92, two infants were recovered from two small side rooms.

Space 83

F.3080 (16411)

The nearly complete skeleton of an adult female was found near the surface of Space 83. Likely representing the interment of an individual related to the building above, the skeleton was in poor condition. Tightly flexed at the hips and knees, the body was on its lefts side. The head was on its left side, facing northeast with the apex of the head to the south. No grave cut was observed due to the erosion of the skeleton and the immediate area around it.

Space 84

F.3088 (16465)

An older adult female skeleton was recovered near the surface in Space 84. Eroded from the building above, the skeleton was in poor condition and it had been highly disturbed. The body was on its left side in a tightly flexed position. The apex of the head was pointing to the east and the feet to the northeast. The head was on its left side, facing south. A juvenile skeleton (16474) was buried immediately under the adult female.

F.3089 (16474)

The disturbed remains of a child aged 4-6 years at the time of death were discovered immediately below an adult female (16465). Like the adult skeleton, the juvenile skeleton was in poor condition. Buried on its left side, the body was tightly flexed at the hips and knees. The head was to the west and the feet to the east. The head, mandible, and several other bony elements were missing entirely. Black staining was observed on several bones. The grave cut was visible at the eastern and southern edges of the cut. Animal and root disturbance was extensive in the area of the skeleton.

F.6065 (17533, 17536, 17545, 17546, 17548, 17549)

In Space 84, near the south-east corner of Building 77, a multiple burial (F.6065) was encountered at the end of the season. By the close of the season, the grave consisted of six individuals although it is likely there are more under the wooden walkway. The individuals were interred from a building above which was eroded. No context information could be obtained. Two adults and four infants were unearthed from this multiple grave.

The last individual to be placed in the grave was an adult female (17536), which disturbed an earlier adult male (17533). In turn, the interment of skeleton (17533) truncated a 5 year old (17546), an infant approximately 9 months old (17549), and two neonates (17545, 17548). All four of these skeletons were severely disturbed. Therefore, apart from the child (17546) who overlaid one of the neonates (17545), chronological relationships between these four is not clear.

Fig 114: Headless adult female skeleton (17536) in a sitting position from F.6065 in 4040, view to north.

(17536)

This adult female seems to be the last one buried in the grave and disturbed all the others exposed thus far. This female was lying on her back in a semi-upright position with the legs drawn up to the chest (Figure 114). The skeleton may have been placed in a sitting position, leaning onto another individual (17533). The body was oriented east-west with the upper body to the west. The head was missing. Its absence may be due to intentional removal during

Neolithic times or this may be the result of erosion. Both arms were on the abdomen and flexed at the elbow. During the interment of this female (17536), another individual (17533) was disturbed, and possibly some or all of the other four juveniles and neonates in the multiple grave.

(17533)
This individual was an adult male lying on its right side in an east-west direction with the head to the west (Figure 115). The body was semi-flexed with the legs bent at the knees and placed under the torso as in a kneeling position. The arms were together, fully extended on the right. The head and the upper torso were higher than the rest of the body, which sloped downward to the east. The head and left part of the pelvis was disturbed during the interment of a later individual (17536). The head, for example, was pushed or placed slightly away from the rest of the body towards the south-west. A layer of red ochre was present under the cranium. It is possible the layer of red ochre was placed by the side of the body and the head was pushed onto it during the disturbance. During the interment of this adult male (17533), the disturbance of the other individuals (17546, 17545, 17548, and 17549) already in the pit may have also occurred.


Figure 115: Adult male skeleton (17533) from F.6065 in 4040 area with red ochre spread under the head, view to south.

(17546, 17545, 17548, 17549)
The remains of four other individuals were recovered in the multiple grave pit. These individuals may have been disturbed by the interment of (17533) or during other burials events. The level of disturbance complicates the reconstruction of the sequence of the burial events and the relationships between the individuals in the pit. It was noted, however, that the juvenile (17546) was found above the neonate (17545), suggesting that the neonate was buried earlier than the juvenile.

Space 92
F.4052 (16712)
The skeleton of a neonate was found in a side room west of B.52. The infant may or may not be directly related to this building. The upper body of the newborn was on its back while the lower body was on its right side. The head was pointed to the south, facing east. The left lower leg and foot were missing. The grave cut was partially visible around the head but animal disturbance obscured the cut on the other sides. A second neonate (16723) was found nearby.

F.4053 (16723)
The second neonate was found in a side room west of B.52. Like the neonate (16712), this neonate may or may not be directly related to this building. The neonate was on its right side, head to north, facing south. The skull is in poor condition. Several upper body bones are missing. A shell fragment was recovered in the grave fill. The grave cut was clear.

South Area
Building 75, Space 328
Three individuals were found in B.75. Two were infants and one was an adult.

F.2648 (16513)
The tightly flexed skeleton of an adult male was found eroding along the western section of a 1960s trench. The lower part of the body had been lost by the truncation and subsequent erosion. The bones are in poor condition. The body was highly compacted to fit into the small grave pit. The main axis of the body was oriented east –west with the upper body to the east. The body was on its right side while the head was on the left. The head was twisted so that the apex of the head was oriented to the north. The neck vertebrae were highly curved to accommodate this head position. A talon of an eagle-size bird was found at the chest. Black residue was noted at the vertebrae and ribs.

F.5001 (16556)
The partial skeleton of a neonate was found eroding in the western section originally excavated in the 1960s. The majority of the body had been lost when the grave was truncated and due to subsequent erosion. The bones are in poor condition. The only bones remaining were parts of the cranial vault, a few ribs, a few vertebrae, and the right tibia. The grave cut was clear in some areas but indistinct in others. Phytoliths were sampled from the base of the skull and the ribs. The infant may have been buried in a basket.

F.5004 (17063)
Buried near an oven in B.75, a neonate was found on its back with the legs drawn up. The head was on its left side, facing east and slightly downward. Some bones were missing. The grave cut was not clearly visible until the skeleton was lifted. Phytoliths were recovered from the upper thorax region and the lower legs. A disarticulated adult humeral head was found near the knees of the neonate.

IST Area
Building 63, Space 289
Two neonates buried in the same pit but at different times are the first Neolithic burials to be recovered from the Ist Area.

F.2325 (13969)
A neonate was placed on its left side in a north-south orientation near the eastern wall of Space 289. The head was to the north, facing east. The legs were tightly flexed with the upper body pushed forward so that the spine was visible. A small clay ball was found in the abdominal area. The interment of the neonate disturbed another neonate (13985).

F.2325 (13985)
The skeleton of a neonate was disturbed during the interment of another neonate (13969). Placed on its right side, the disturbed neonate was in a north-south orientation, probably facing west. Only the left shoulder, left arm, and left leg of (13985) remained in situ. The rest of the body was scattered or missing entirely. The grave cut was visible only at its northern edge.

TP Area
A minimum of 11 Neolithic skeletons were recovered in the TP area during the 2008 field season. Ten of these individuals were recovered from a multiple grave context (F.6000) in a small room (Space 327) with incised architectural features. Another adult burial (F.6001) was found outside of the excavation area.

Space 327
F.6000 (15838, 17622, 17623, 17624, 17625, 17626, 17698, 17699, 17823, 17807)
At least 10 individuals were among the randomly scattered remains of human bones found in a small elaborated room (Figure 116). One headless individual (17698) was articulated at the bottom of the pit. Another skeleton (17622) was also articulated and headless. The bones were densely scattered throughout the northern portion of the room with a lighter concentration of bones in the southern part of the room. The burial chamber is the first example of its kind at Çatalhöyük where there is a decorated room specifically built and used for burial purposes. There were at least three infants; one is nearly complete but headless (17622). There were 36 indirectly associated grave items found within this chamber; none

could be associated with any specific individual. The grave goods included stone beads, flints, arrow heads, axes, a flint dagger, worked bones, and a figurine.

Figure 116: The first layer of the burial chamber F.6000 in TP area, view to west.

Complete Skeletons

(17698)

One of two complete skeletons was a headless female skeleton (17698) that was found at the lower layer of the room. It is likely the remains of earlier burials were disturbed by this interment. This flexed skeleton was lying on its left side, oriented west-east with the head to the west (Figure 117). The head was removed during Neolithic times after the skeleton had fully decomposed. Phytolith remains were noted on several places throughout the body including the elbows, which suggests that the body was bound pre-interment.

Figure 117: Headless adult female skeleton (17698), the last burial from in the burial chamber in TP area, view to west.

(17622)

A headless skeleton was found in the southern part of the chamber. An infant skeleton was lying on its stomach, slightly tilted to the left side. The head was missing. The presence of the first two cervical vertebrae suggests a deliberate removal of the head. However, disturbance of the skeleton during other burial events could also be reason for the absence of the head. The legs were bent at the knees and the lower legs crossed under the body. The right arm was bent under the body while the left arm was extended by the side of the body.

Partial Skeletons

The skeletal elements of the other individuals in the grave were found scattered throughout the room. Skeleton unit numbers were given to all skulls and some of the partial skeletons. These skeleton numbers and a brief description are as follows:

(17699): semi- articulated skeleton, right lower leg located in north-east corner of the room
(17623): an adult cranial vault located in the central part of the room; some disarticulated postcranial bones
(17624): an adult female skull, located in the northern part of the room
(17625): a crushed male skull found in the north-west corner of the room
(17626): a partially articulated young adult male skeleton; torso, pelvis, and left femur in articulation, right femur found nearby
(17807): semi-articulated torso found by the north wall of the room
(17823): partially preserved skull, mainly facial bones and maxilla placed by the eastern wall
(15838): partially preserved adult skull

F.6001 (17616)

This grave was found outside of the TP excavation area to the west (Figure 118). The grave was highly disturbed by weathering processes and it had been truncated by earlier excavations in the 1960's. Many skeletal elements were missing due to the truncation. The bones were disarticulated and placed randomly in the grave, suggesting that this may have been a secondary burial where the bones were brought from elsewhere. Preliminary indicators suggest the remains belong to one individual.

Figure 118: A secondary context burial (17616) from F.6001 in TP Area, view to east.

West Mound
Trench 5

F.5069 (16835)

The first Chalcolithic burial was found in Trench 5 on the West Mound. The partial skeleton of a neonate was found near or under a wall in Space 342. Placed on its right side, the neonate was likely to have been in a flexed position.

Post-Neolithic Remains
4040 Area

Three Post-Neolithic skeletons were excavated and lifted in the upper levels of the 4040. Two of the skeletons were adults and one was a juvenile. All were face up. Grave goods were found at the feet of two of the skeletons. Based on body position and orientation and the types of grave goods, these individuals appear to be late Roman.

F.3081 (16427)

Dorsally extended, head to the west and feet to the east, this Post-Neolithic skeleton of an adult was found cutting into B.77, Space 83. The head was face up with the head and mandible intact. The arms were extended alongside the body. Several elements were missing, displaced, or highly fragmented. The bones were in poor condition. Remnants of the coffin were present. No grave goods were found in association with this adult.

F.3084 (16442)

The skeleton of an adult from Post-Neolithic times was found cut into Space 84. Dorsally extended, head to the west and feet to the east, the skeleton was in poor condition. The head was face up. The arms were extended alongside the body. Proximity to the surface, animal activities, and root action accounts for the most of the disturbance to the skeleton. The grave cut was clear. Grave goods included a ceramic vessel, a bone pin, a bone needle, and a copper pin. All were located at the feet of the individual.

F.3085 (16445)

The skeleton of a Post-Neolithic juvenile was found cutting into Space 84. Dorsally extended, head to the west and feet to the east, the head was on its base, facing east. The arms were extended alongside the body. The bones were in poor condition since the bones were close to the surface and highly eroded. Several bony elements were broken or missing. Root disturbance and animal action contributed to the poor condition of the bones. The grave cut was clear. Associated grave goods found at the foot of the grave included a glass vessel, a bone pin, and a bone needle. Two clay balls were also found in the grave fill. Coffin nails were found in several areas of the grave.

West Mound
Trench 5

One Post-Neolithic skeleton was excavated on the West Mound. Scattered human remains from disturbed late graves were found throughout Trench 5.

F.5060 (17200)

The disturbed remains of child were found in Trench 5. A partial skull, cervical vertebrae, a few rib fragments, right clavicle fragments, left scapula, left partial humerus, radius and ulna, hand phalanges, and partial right and left hip bones were recovered. The body was dorsally extended with the head to the west and the feet to the east. Ten coffin nails were found. Disturbance to the grave may be due to activities related to animals or to modern humans.

Macro Botanical Remains 2008 - Amy Bogaard, Mike Charles, Müge Ergun, Füsun Ertuğ and Dragana Filipović

Team leaders: Amy Bogaard *(1)* & Mike Charles *(2)*
Flotation officers: Alexandra Livarda *(3),* Ellen Simmons *(3)*
Flotation workers: Mevlüt Sivas (*4),* Hüseyin Yaşlı *(4)*
Archaeobotanical assistants: Garrett Boyd *(2),* Müge Ergun *(5),* Danielle De Carle *(2),* Catherine Longford *(2),* Michael Wallace *(2),* Katarzyna Regulska *(6)*
Ethnobotanist: Füsun Ertuğ *(5)*

(1) University of Oxford (2) University Sheffield (3) Çatalhöyük Research Project, (4) Kücükköy, (5) Istanbul University, (6) Poznan University

Introduction

The aims of this report are to summarise

- preliminary archaeobotanical results for the 2008 season,
- current archaeobotanical work by postgraduate students,
- ongoing study of plant remains in burnt mudbricks,
- ongoing ethnobotanical work in the Konya area, and
- collaborative research projects with other specialists working at the site.

Preliminary archaeobotanical results for 2008

The flotation team processed 688 samples (c. 10,527 litres of soil) during the 2008 season. As in previous years, at least 30 litres (where available) were processed from each deposit; average sample size was c. 15 litres in 2008.

We carried out level 1 assessment on samples from the 2008 excavations in the 4040 and South Areas of the East mound, and from the various trenches active on the West mound. Level 1 assessment consists of identification and counting of crop and wild plant remains in a random subsample of the >1 mm flot fraction, plus scanning of the >4 mm flot fraction (see 2005 Archive Report for methodology). We also completed a small backlog of samples from the 2007 excavations in the 4040 and South Areas; similarly, there will be a small backlog from 2008 to be cleared in 2009. As in previous years, samples from the Poznan excavation area did not receive level 1 assessment in the field since the TP archaeobotanist, Marek Polcyn, will carry out sorting and assessment of this material in Poland.

A total of 12 samples derived from excavation units designated as priorities for specialist feedback in the course of the 2008 season: five from the South Area (all from "Level IV" midden in Space 319), six from the 4040 Area (a possible street surface in Space 271; organic-rich deposits from burnt Building 77) and one from the Istanbul Area. These priority samples received level 2 assessment (identification and counting of crop and wild plant remains in a larger random subsample of 1 mm flot fraction, plus a subsample of the >4 mm fraction – see 2005 Archive Report for methodology).

Considering all of the units processed in 2008 and assessed at levels 1 or 2, c. 190 contain at least 100 items and are potentially rich enough to warrant full analysis. Around 30 of these samples are also very high in density, containing hundreds or thousands of seed/chaff items per litre soil. These particularly rich/dense samples mostly come from areas of in situ burning (e.g. fire spots in the South and 4040 Areas; burnt Building 63, Istanbul Area; burnt Building 77, 4040 Area).

2008 priority units associated with in situ burning events, and/or unusually rich/activity-specific in botanical content (i.e. all of the priorities from the South and 4040 Areas) ultimately received full botanical analysis ('level 3 assessment'), involving full sorting and identification of the 4 mm, 1 mm and 0.3 mm flot fractions (or representative sub samples thereof), along with botanical material from heavy residue sorting. A further c. 50 samples, from 2008 and previous seasons were designated as 'botanical priorities' due to their association with in situ burning events and/or rich botanical content. These samples also received level 3 assessment in the field; some of the wild seed types encountered will require further study using reference material in the UK.

Below we present initial description, interpretation and discussion of 2008 samples from selected units of particular archaeobotanical interest.

4040 Area, Building 77

Important botanical finds from the 2008 season included plant concentrations recovered from burnt Building 77 (see 2008 Archive Report by Michael House). A deposit of glume wheat spikelets (pairs of grains still enclosed in their glumes or 'hulls') was recovered in front of two large bins in a side room (Space 337) of Building 77 (Figure 119)Contextual interpretation of this deposit in terms of space use and burning in Building 77 will require full integration with other datasets, but the volume of the deposit (several litres) and their location near bins suggests a plausible association with storage practice. This finding is particularly significant for two reasons. First, the form in which glume wheats are stored (as spikelets or naked grain) has broader implications for routine crop processing practice. The general ubiquity of glume bases and spikelet forks at the site, resulting from the dehusking of spikelets, suggests that this crop type was stored in the spikelet and dehusked piecemeal throughout the year. For the first time during the current project, we have recovered direct evidence for spikelet storage; from the Mellaart excavations, Helbaek (1964: 122) noted the presence of 'spikelet parts' in 'emmer deposits', suggesting that similar storage practices were more widely attested. The second implication of the spikelet deposit concerns the glume wheat 'type' represented. The well preserved spikelet forks/glume bases correspond to the 'new type' of glume wheat recently defined by Jones et al. (2001), while the (more abundant) grain resembles the associated grain type described by Kohler-Schneider (2001). The taxonomic status of the 'new type' glume wheat is ambiguous (e.g. a variant of emmer, or a distinct species – see Jones et al. 2001), but the 'pure' deposit of spikelets from Building 77 suggests that it was grown and stored separately to the 'classic' emmer also attested at the site.

Figure 119: Glume wheat spikelet deposit, Building 77 (unit 16480) Photo Bogaard & Charles

A second 'rich' botanical deposit from burnt Building 77 was recovered in the south-east corner of the main room (Space 336), near the ladder base. Preliminary analysis of this deposit suggests that it consists of charred peas mixed with lumps of burnt matter that include many bones of small ('anchovy-sized') fish, including articulated vertebrae, as well as occasional reed stems (Figure 120, unit 16498). Interpretation of this deposit must incorporate full analysis of all ecofactual material, but the combination of fish and pulse remains, together with the find location, suggest that this is not a straightforward storage deposit.

Figure 120: A deposit of peas (16498) was recovered in the corner of the main room in Building 77. Photo Bogaard & Charles

South Area, late Neolithic midden

Excavation of a series of midden layers that accumulated against the southern walls of Building 56 and Building 44 (see 2008 Archive Report by Regan et al.) yielded a series of modest botanical assemblages. The material is of particular interest since few stratified midden deposits of the upper Neolithic sequence have been excavated thus far. Botanical densities tended to be low but individual layers analysed included activity-specific residues: for example, unit (16259) was dominated by large-sized weed seeds (especially weed barley) suggesting hand-cleaning of crops. Full analysis of the late Neolithic midden will enable comparison with earlier middens of the South and 4040 Areas, as well as with later midden in the TP area.

'Fire spots' in the South and 4040 Areas

A number of small discrete areas of in situ burning ('fire spots') containing charred plant material were encountered in the South Area, as in 2007 (see 2008 Archive Report by Regan et al); others were encountered in the 4040 Area. These contexts were targeted for full botanical analysis since they potentially provide evidence for individual events and localised activities (see also 2007 Archive Report).

Fire spots excavated and analysed in 2008 included two units ((16518), (16539)) in Space 333, South Area, associated with use of a large oven (F.2639) and dominated by cereal grain. These deposits may represent food accidentally burned during preparation. The botanical content of other fire spots appeared to reflect fuel residues, in several cases including intact sheep/goat dung pellets and the seeds sea clubrush (Scirpus maritimus syn. Bolboschoenus maritimus) preserved with dung adhering to them (for example, unit (16265), Space 329, South Area; unit (14194), Space 271, 4040 Area). These discrete dung-derived assemblages will help us to tease apart the wild taxa that routinely enter the assemblage in dung from those associated with crops as arable weeds. These finds also shed important light on the nature of animal feeding around the site – suggesting, for example, sheep grazing along the river in late summer.

Building 63: final excavation of 'storeroom' bins

The final season of excavation by the Istanbul team (see 2008 Archive Report by Mihriban Özbasaran) included further excavation of Space 283, Building 63 in collaboration with the archaeobotanical team. A clay bin (F.1967) containing naked barley grain was mostly excavated in 2006 (see 2006 Archive Report by Özbasaran); further investigation this season confirmed that the floor of this bin 'steps' sharply down on the north side, forming a wide narrow 'slot' also filled with naked barley grain (unit (13962)). The purpose of the step may have been to 'funnel' the grain towards an opening at the base of the front of the bin, enabling material most liable to damp to be removed first. Similarly 'stepped' bin floors are attested elsewhere at the site (e.g. feature 2005, Building 52, containing wild mustard seed – see 2005 Archive Report by Doru Bogdan). The northern wall of feature F.1967 was cracked by fire damage; no original opening at the base of the bin could be discerned.

Immediately to the west of feature F.1967, in the corner of the room, streaks of wood charcoal appeared to trace the contours of a wooden container. This cluster was associated with cereal grains, mostly identifiable as naked barley (unit 13963). The contents of this feature appear to be separate to the barley in adjacent bin F.1967.

Finally, along the northern side of Space 283, cracking in unexcavated room fill revealed a lens of cereal grain (unit (13992)). Further excavation suggested that the grain derived from a destroyed bin (F.2324). Preliminary identification of the grain suggests that here also naked barley is represented.

Research Projects

Exploring plant use and husbandry in the site's lower-middle phases - Dragana Filipović

My project is focused on the production and interpretation of new evidence for plant use and crop husbandry in the early-mid Neolithic sequence of Çatalhöyük East. The aim is to identify the major taphonomic factors affecting the assemblage, to consider the role specific plants and processes played in the human and animal diet, to reconstruct crop growing conditions and to assess possible relationships between crop and animal husbandry. Finally, I will consider social, economic and ecological context of crop cultivation at Çatalhöyük East taking into account the broader context of the Neolithic in Central Anatolia and beyond (for more details see Archive Report 2007).

Archaeobotanical analysis of 117 flotation samples (from 96 excavation units) from the early-mid Neolithic sequence (Levels Pre-XII to VI, 7400/7100 - 6500/6350 cal. BC - Cessford et al. 2005) has recently been completed. Only samples from well-defined depositional events and containing a significant amount of identifiable/scorable plant remains (other than wood charcoal) required for statistical analysis were selected for detailed investigation. The archaeobotanical analysis consisted of sorting, identification and quantification of all crop and wild plant remains (except for wood charcoal which was sorted and volume measured). Identification was carried out to the species level wherever possible; otherwise remains are placed in species/genus/family 'types'. In order to achieve accurate and (where possible) species-level identification, I compared archaeological material with specimens from modern seed collection housed at the Institute of Archaeology, UCL, the herbarium of the Royal Botanic Garden, Edinburgh, and the British Institute of Archaeology at Ankara.

In order to consider internal variability across the archaeobotanical dataset, which is the next step in my work, appropriate statistical and ecological methods are required. The aim is to disentangle various sources of plant remains in archaeological contexts and processes affecting their deposition and preservation. In this context, I will also use ethnoarchaeological models (e.g. crop processing, animal dung use as fuel, crop husbandry regimes) to identify and assess Neolithic practices. Useful ethnographic data on plant processing and husbandry were collected as part of fieldwork in the Kastamonu region in August, 2008, funded by a British Institute of Archaeology at Ankara study grant (see also below, Ethnobotanical work in the Konya region and beyond). In addition, I participated in the Earth Summer School (funded by the ESF) on non-industrial agriculture, organized in the region of Asturias in northwest Spain (August 2008). There I had the opportunity to observe small-scale traditional cultivation of another hulled wheat (spelt), use of traditional tools, processing of spelt and storage practices, as well as to speak with local farmers. Observation of traditional agricultural activities will enable me to evaluate certain ideas related to my research. Ethnoarchaeological data on plant processing and husbandry will also be abstracted from published sources (e.g. Hillman 1981, 1984; Jones 1984; Jones et al. 1999, 2000).

On the basis of results from exploratory multivariate statistic analyses (in particular, correspondence analysis), I will isolate and interpret species/samples relevant to the crop growing environment in order to infer individual aspects of crop growing at Çatalhöyük East and to evaluate previously proposed models for Çatalhöyük. I will use a problem-oriented multivariate statistical technique (discriminant analysis) to compare the Çatalhöyük weed data with modern weed survey data from intensive and extensive cultivation in Turkey and elsewhere. Once the taphonomy and husbandry of plants are clarified, I will be able to discuss the specific roles of wild and domestic plants in foodways and other plant-related activities (animal feeding/grazing, fuel use etc).

The archaeobotany of a burned house: Building 63, Istanbul Area - Müge Ergun
For the purpose of my Msc dissertation, 22 samples from the IST Area, mainly deriving from Building 63, were analysed in order to assess compositional variation between contexts in terms of domesticated and wild plants in the samples and the economic and cultural roles of these plants for the inhabitants.

The analysis has demonstrated cultivation of the following crops: naked barley, the glume wheats (including emmer, einkorn and "new glume wheat type") and free- threshing wheat, with smaller amounts of pea, lentil and bitter vetch. There are a few occurrences of hulled barley grain. The wild plants represented in the assemblage are quite varied and rich, including possible arable weeds and wetland species, a combination characteristic of the site (Fairbairn et al. 2005). Post-processing mixing of different crops is prevalent in most of the samples; additionally wild plants pointing to different habitats and weed seeds from different crop processing stages commonly occur together. These 'mixed' samples potentially contain material derived from dung fuel. Such samples contrast sharply with concentrations of stored naked barley in several bins in the 'storeroom' of the house (see also above, Building 63: final excavation of 'storeroom' bins).

The archaeobotanical samples from the IST Area provide information on the household economy of Building 63, which at the time of its destruction contained stores of naked barley grain. Amongst the crop components, naked barley grains and glume wheat chaff constitute the most abundant items overall in the assemblage. Barley grains are significantly more abundant in the bin-lined 'storeroom', while glume wheat chaff tends to occur abundantly in the living spaces and especially in mixed samples. Glume wheat grains tend to occur in significant amounts in mixed samples dominated by either wild/weed seeds or glume wheat chaff. The overall picture indicates the use of glume wheat chaff for purposes other than human food, in contrast to naked barley grain.

Study of botanical inclusions in mudbrick
Following on from the work on botanical inclusions last year, we selected a set of burned mudbricks from the storerooms in consultation with Philippa Ryan (see also phytolith report, this volume) and Mira Stevanović. The aim of this continued pilot study was to extract and identify intact plant remains in order to assess which plant materials were incorporated into this building material (e.g. as temper) and how this material compares with plant materials represented in other deposit types. A particular question concerns cereal straw, which appears to be virtually absent in the assemblage otherwise: was straw used preferentially as a temper, for example?

Seven samples were selected for investigation based on visibility of well preserved plant impressions – and in some cases whole silica skeletons of plant parts – on the exposed brick surface. The samples selected mostly derived from burnt Building 52 (all from unit (10286)); additionally, one burnt brick from the South Area unit (1042) and one from the Istanbul Area unit (11864) were also investigated.

Using a protocol developed in 2007 (see 2007 Archive Report), we fractured the bricks in order to expose fresh surfaces, and scanned these surfaces under a low-power binocular microscope. Silica skeletons of cereal plant parts were observed in most of the bricks and included awns, barley rachis and spikelet forks of glume wheats. Other plant parts observed were reed stems. No parts potentially representing cereal straw were observed. Clearly, a wider study of mudbricks is needed in order to assess plant tempering of mudbrick, but preliminary results from 2007 and 2008 suggest that the widespread lack of cereal straw observed in a range of deposit types extends also to building material.

Ethnobotanical work in the Konya region and beyond

A three-year ethnobotanical project supported by the Fell Fund, University of Oxford on traditional cultivation, processing and storage of cereals and pulses in various regions of Anatolia (Konya, Kastamonu and Kars) was initiated in July, 2008. This project is a collaboration involving Amy Bogaard, Michael Charles, Füsun Ertuğ and Glynis Jones; work in 2008 was supported by Müge Ergun and Dragana Filipović. The brief account presented here focuses on work and observations in the Konya region.

An exploratory trip in May, 2007 had revealed that farmers employing traditional husbandry methods (irrigation and manuring) to grow cereals and pulses without chemical fertilisers or herbicides are now restricted in the Konya province to a cluster of villages in the Sorkun district, south-west of Konya in the Taurus mountains. Fields in one particular village are managed under varying regimes of flood irrigation and manuring, without chemical fertilisers (Figure 121). We returned to the village in July, 2008 in order to sample fields for analysis of carbon and nitrogen stable isotope ratios in crops and soils (see also below, NERC-funded project on 'Crop stable isotope ratios') and to interview residents about cultivation, processing and storage of cereals and pulses, past and present.

Figure 121: View of Sorkun district cereal fields showing a. flood irrigation with earthen channels; b. field with adjacent manure pile. Photo Botany Team

The inhabitants of Taşkale, a village to the south-east of Konya (Karaman province), use a traditional system of long-term bulk crop storage in bin-lined rooms cut into a local cliff face (Figure 122). Though Taşkale farmers increasingly use modern industrial farming methods, an initial visit in May, 2007 had confirmed that valuable information on traditional agricultural practices could be gathered. We returned in July, 2008 in order to interview villagers about past and present storage practices and their relationship to scales of agricultural production.

Figure 122: View of Taşkale showing rock-cut granaries in cliff face (right). Photo Botany Team

Collaborative projects
There are currently two major research projects involving the archaeobotanical team and other specialists working at the site.

NSF-funded project, 'Economic integration and cultural survival at Neolithic Çatalhöyük, Turkey'
Work continued on a three-year project led by Drs Katheryn Twiss (faunal team) and Amy Bogaard focused on the nature of crop/livestock management and consumption midway through the Neolithic sequence (around Mellaart's Level VI) and in subsequent phases (e.g. Mellaart's Levels V-IV) (see also 2007 Archive Report). Following completion of full analysis of units jointly selected by the faunal and botanical teams in 2007, a further list was negotiated in order to target high-integrity ecofactual deposits from a range of contexts in the 4040 and South Areas. Much of the full botanical analysis conducted during the 2008 season (see above) will contributed directly to the results of this project.

Selection and processing of samples for various isotopic analyses is also underway in collaboration with Dr. Jane Evans (NERC Isotope Geosciences Laboratory, Keyworth) and Dr. Jessica Pearson (University of Liverpool). Preliminary results of strontium analysis of charred plant remains from Building 52 look promising for the elucidation of cultivation and gathering areas in the wider landscape.

NERC-funded project, 'Crop stable isotope ratios: new approaches to palaeodietary and agricultural reconstruction'
This three-year investigation focuses on the use of stable nitrogen and carbon isotope ratios in plant, faunal and human remains for understanding palaeodietary pathways and for tracing the impact of crop husbandry practices
(see http://www.arch.ox.ac.uk/research/research_projects/crops). The Çatalhöyük case study involves Bogaard, Charles, and Jones on the botanical team in collaboration with Dr. Jessica Pearson (Liverpool), Dr. Tim Heaton (NIGL/Keyworth), the faunal team and the human bone team.

Work this season focused on the selection of faunal samples, in consultation with Dr. Jessica Pearson and the faunal team, and of botanical samples. In archaeobotanical terms, the aim is to target concentrated, 'storage-type' deposits wherever possible. In collaboration with Dr. Andrew Fairbairn, The University of Queensland, the intention is to include note only plant deposits from recently excavated burned buildings, but also those sampled by Helbaek during James Mellaart's excavations.

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Woven and Twisted Fibres – Shahina Farid

One of the most exciting finds of this season was a nail size fragment of woven textile and a tiny length of finely twisted cord.

Figure 123: Close up of shell beads and copper tube threaded with fine twisted cord around the neck area of infant (17457), F.4023.

Both of these pieces were found associated with an infant burial (17457) F.4023 in the NW platform of B.49, 4040 Area. The infant was the first of nine to be buried in this platform and was buried with a number of artefacts. Near the neck was the tiny fragment of textile and a thin folded copper tube through which a fine twisted cord was emplaced. Preserved by corrosion the copper seems to be a thin rolled sheet through which the fine string was passed or the copper was rolled around (?). Other artefacts included a shell bead necklace, a bead anklet of black, white and pink stones, several shells, flint and a bone spatula. Traces of blue and red pigment were also found. A dark residue and stain may be decayed leather in which some of these objects may have been placed. The infant lay on the phytolith traces of matting in which the body may have been wrapped.

Figure 124: (left) Detail of twisted cord threaded through rolled copper tube and (right) the fragment of textile found close by.

This is the first evidence of textile found at Çatalhöyük since the 1960s (Mellaart).

The textile is unstudied as it was found towards the end of the season but 1960s textiles from the site have been identified as linen/flax.

Acknowledgements
Thank you Nerissa Russell, Amy Bogaard, Wileke Wendrich and Alexandra Bayliss for comments and references over email.

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Phytolith report 2008 - Philippa Ryan

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Abstract

Samples were analysed from the onsite 'priority units' and other samples taken for future analysis during 2008/9. Particularly interesting contexts for phytolith analysis (a micro-botanical technique) this season included outdoors firespots with in situ ashy deposits and these will be analysed to investigate fuel use and possible usage differences between hearths/ovens/firespots. Several visible phytolith remains were found including cordage remnants around an antler (14460) 4040 Area, a neonate burial basket (16556) South Area and from a basket (13932) IST Area which appeared to contain grinding-stone fragments. Samples were also taken from the dental calculus of animal teeth (sheep/goat/cattle), grinding-stones, and burnt mud-bricks.

Introduction

Samples were analysed onsite between 8 July – 2 August 2008 and included 'priority units'. Further samples were taken for future analyses during 2008/9 at UCL. Plants take up soluble silica in ground water and phytoliths are silica bodies, which form between and within certain plant cells. Not all plants produce phytoliths and levels of taxonomic identification and production levels vary. Phytolith analysis is a useful technique because its ability to identify different plant parts enables the investigation of various types of plant use – for construction, fuel, craft activities or food. Current phytolith work at Çatalhöyük investigates diversity of plant use and types of microenvironments exploited and a broad range of archaeological contexts are examined including house features (particularly storage contexts and hearths/ovens), middens, construction materials and visible remains of basketry/matting. This archive reports discusses firstly the analyses on site of priority and some additional units, followed by details of samples taken from mud-bricks, grinding-stones, sheep/goat/cattle dental calculus and archaeological dung.

Methods

Sample processing and analysis follow methods described in archive reports from 2006/7.

Priority samples Analysed between 8/7/08 - 4/8/08

16262 s3 Space 319 South Area - midden/ trampled surface
This unit has a moderately high percentage of phytoliths. The phytolith assemblage is typical of midden deposits and includes monocot leaf/stem, wheat husk (Triticum sp.), and dicot phytoliths most likely suggesting household refuse possibly from rake-outs. Compared with many midden deposits there is a higher ratio of single to multi-cell phytolith forms present indicating that this deposit was subject to some post-depositional disturbance. (16262) is a mix of a thin clayey lens and a broader ashy lens. Other clayey lenses analysed in Space 319 have high levels of single-cell phytoliths and low phytolith percentages whilst the ashier

lenses seem to have higher amounts of multi-cell to single-cells and overall higher phytolith percentages (see discussion for (16253).

16260.s3 Space 319 South Area - midden
This unit had too much charcoal present to clearly identify the multi-cells present during on-site assessment and will be processed fully at UCL during 2008/9.

16253.s3 Space 319 South Area – midden
This has a similar composition to unit (16262) but has barley (Hordeum sp.) as well as wheat (Triticum sp.) husk silica skeletons present. This unit has a higher percentage of phytoliths present than (16262) and also a slightly higher ratio of multi-cells to single-cells. This is typical of a general pattern observed in Space 319 between ashier lenses, such as this one, and thinner more clay rich lenses (possibly interpreted as some kind of activity/trample surfaces) that are found alternating with these ashier lenses.

16259.s3 Space 319 South Area – midden/ trampled surface
This lens has a very low percentage of phytoliths. This is typical of the thinner clay rich lenses found in the midden sequence in this space (see discussion for unit (16253)). This sample is similar to unit (16262) but has a lower percentage of phytoliths. This is probably because (16262) is a mix of a clayey lens and a broader ashy lens whilst this unit only consists of a clay rich lens (described as a possible trample lens during the excavations).

13970.s3,s4,s5 B63 IST Area – pot and pot fill
S3 - a white line of visible phytoliths could be seen on the exterior of a sherd. Phytoliths were from an unidentifiable monocot leaf/stem. This was most likely from the surrounding fill.
S4 - a second sample was taken from the fill inside the pot. There was no phytolith indication of what might have been stored in this pot.
S5 - a third sample was taken from the surrounding fill and this had non diagnostic phytolith content. The phytolith percentage was very low and typical of sterile fill deposits. This sample was similar in composition to S4 suggesting the fill inside the pot is the same as the fill of the broader unit.

14460.s3,s4 B49 4040 Area – visible phytolith remains on antler
S3 - An antler (x2) found in this unit was covered in visible phytolith remains. A criss-cross pattern, indicating the presence of twine, surrounded the whole antler. Additionally some areas of the antler were covered in denser white patches of phytoliths. The twine was composed of phytoliths from sedge (Cyperaceae) stems and the denser patches were composed of wheat and barley husk silica skeleton phytoliths (phytolith analysis cannot indicate whether or not cereal grains were present). Several samples were looked at and cereal husk phytoliths were present around the whole of the antler. The visible phytolith remains indicate the presence of whole plant parts, which have decomposed in situ – the criss-cross pattern is the remains of cordage and the dense patches of husk phytoliths are the remains of husks compressed onto the antler. It is likely that the twine was attaching the husks to the antler or that the husks were placed tightly around it.
S4 - a sample was also taken from an area of sediment close to the antler as a control. This had a low percentage of phytoliths and most phytoliths present were single-cell as opposed to multi-cell indicating that at least some (this sample is only taken from a small area) of the sediments present in the broader unit were re-deposited fill). The lack of wheat husk silica-skeleton phytoliths supports the possibility of the antler being a special deposit with cereal husks bound onto it with twine.

Other units analysed on site

16518.s3 Space 333 South Area – probable oven rake-out (this was an unusually large oven F2639)
There are a very high percentage of phytoliths present. The phytoliths are from a limited range of plants indicated by a low diversity assemblage which is fairly unusual for a rake-out deposit. The preservation of large silica skeletons indicates that this was a quickly sealed deposit. Phytoliths are dominated by silica skeletons from a particular wild grass common to several ashy deposits analysed. Whilst the genus of this plant is as yet uncertain, it is likely to

have been growing in a wet growing environment - due to large silica skeleton size as well as a high correlation co-efficient with known wetland plants (such as sedges) in other samples which have been quantifiably analysed. Other phytoliths present include from sedges and several large wild grass husks (cf. Bromus sp.) - the large size of which again indicates a wet growing environment (silica skeletons are made up of <300 cells – whereas most grass husks found on site (including from cereals) are <50cells). Since wetland plants dominate it is worth noting that Phragmites sp. (a reedy grass) is absent. The phytolith remains present are likely to be from dung fuel and there is no indication about what the oven was being used to prepare – the absence of cereal husk phytoliths is notable for a fire-installation rake-out.

16516.s3 Space 319 South Area - fire-spot rake out within midden unit (16507)
There was a much higher phytolith percentage within this deposit compared to other midden units within this sequence, which correlates with this being a visibly more ashy deposit. However, this unit does not have a distinguishable phytolith assemblage from the adjacent midden units.

16556.s3 SK 16556 F.5001 B75 Space 328 South Area – neonate basket
Three samples were analysed. Phytoliths present were from sedge leaf (not stem) phytoliths. This is unusual as most neonate burials analysed so far have been made with a specific bilobe producing grass (more than one plant type may be used in weaving (Wendrich 2005), to account for this possibility several samples are analysed).

16714. s3,s4 space 271 4040 Area – external surface/trampled floor
S3 was a 'scrape' sample (a sample taken only approx 2-3 mm in depth) from the greasy floor surface. This sample has extremely low phytolith content and cannot provide any clue to the kinds of activity occurring on the greasy surface.
S4 was taken beneath this surface where the sediment was full of visible thick white lines of phytoliths - observably remains of whole monocot leaf/stems, which have decomposed in situ. It is not clear why these plant remains are present although disposal is one possibility, however it is clear that the activity creating the bulk of the unit (represented by s4) is distinct from any activity associated with the greasy surface (represented by s3).

17063s.3 SK 2199 B75 Space 328 – cordage
Visible cordage remains were sampled from the lower legs of a skeleton. Phytoliths consisted entirely of long cylindroid forms (rods) (as silica skeletons and individual single cells), which indicate the use of a monocot leaf/stem- most likely a sedge stem (since other cells common in sedge leaves or grass leaves/stems were absent).

16590.s3 Space 339 South Area –matting
Visible matting was found, phytoliths present were from sedge leaves/stems. The matting had an orangey colour, which is common to many of the matting samples found, and which contrasts with the purer white colour of other visible silica remains such as basketry.

West Mound Samples (also see West Mound archive report)
Samples were taken for me by Ingmar Franz as small blocks of sediment (circa 5 cm in depth) from units (16921), (16918), and (16946). Several thin (2-3mm depth) horizontal visible lines of phytoliths could be seen running across the extent of the units sampled. In the phytolith laboratory the top of each block was scraped down until the phytolith lens was visible in order to assess any patterning.

1. (16921) Horizontally compressed patches of phytoliths with no patterning. Multicell silica-skeleton phytoliths from Cyperaceae (sedge) stem leaves/stems.
2. (16918) Horizontally compressed patches of phytoliths with no patterning. Multicell phytoliths from Phragmites sp. (a reedy grass) leaves and stems and sedge leaves/stems.
3. (16946) As well as horizontally compressed patches of phytoliths with no patterning, leaf and stem impressions are present throughout the block in various directions indicating some difference in the deposition of this plant material compared to the other two samples.

The assemblage is dominated by phytoliths from Phragmites sp. leaves and stems and sedge leaves and stems, however the multicells are more fragmented with a higher number of single cell phytoliths. In contrast to the other two lenses sedge inflorescence multicell phytoliths also present perhaps indicate a different season of plant deposition (summer/ early autumn) and the sedge cone phytoliths within these multi-cell are all from one type of sedge.

All of the phytoliths present are from wetland plants. The more taxonomically identifiable sedge multi-cells (where stomata and/or sedge cones are present) are all from predominantly one sedge type. All the phytolith types are commonly found on the East mound. Notably these are not ashy deposits or the remains of woven remains - if these were from woven remains some patterning should be visible. These remains are well sealed deposits and represent the in situ decay of wide horizontal extents of plant material.

Burnt Brick Analysis (also see macrobotanical and architecture archive reports)

Figure 125: (11864) visible monocot stem from reedy grass (Phragmites sp) in burnt mud-brick. Photo Philippa Ryan

Following the analysis of burnt bricks during 2007; further samples were taken during the 2008 field season for phytolith analysis and macro-botanical identification in conjunction with Dr Amy Bogaard and Dr Mike Charles. Burnt bricks were selected with the advice of Dr Mirjana Stevanovic. Some burnt bricks have abundant phytolith remains and/or plant impressions. These phytoliths are the silica skeletons of plants which have decayed in situ and whose structure has been preserved by the solidity of the burnt brick. Frequently the phytoliths retain morphological shape and allow varying levels of identification at a macro scale, occasionally to species. This can provide precise information about the use of plant material as brick temper. Samples were taken and analysed from six burnt bricks and further bricks were also selected from burnt Building 77 (excavated this season) for analysis during the 2009 field season with an emphasis on bricks with visible phytoliths. Phytoliths are photographed in their in situ location within the bricks, removed with a scalpel and then, if the morphological shape survives, photographed again. Samples are retained for phytolith analysis. These are prepared for analysis by firstly removing the carbonates with 10% dilute HCL and then mounting the dried sample onto a slide with Entallin. Slides are then analysed at X400 magnification. There is a great deal of variability in amounts of plant material present in burnt bricks with some having little or no plant material present, whilst others have an abundance of visible phytoliths or plant impressions. Some bricks analysed appear to be dominated by chaff and/or thin monocot stems (10286 brick IDs 66, 37, 54, 69; 1042 brick ID 9), whilst others predominantly by much thicker monocot stems (11864 brick ID 11) – see Figure 125. On initial observation these sorts of variations are also apparent in the bricks selected from B.77. Table 7 presents some initial observations and results. Remaining phytolith analysis will be undertaken during 2008-9. Initial results show cereal chaff and leaves/stems from wetland plants being used as brick temper. Notably, so far, there has been no evidence for the use of cereal stems.

Table 7 – Burnt mud-brick Samples taken and analysed during the 2008 field season

Unit No	Space/Building	Area	Plant part	Macro ID	Phyto ID
(10286) Brick ID 66	B52 space 94	4040	Stem (1)		*Cyperaceae* (sedge)
			Unident. Fragments		
			Stem (2)		
			Glume	Possibly	

				Triticum monococcum (Einkorn)	
(11864) Brick ID 11	No space/building no.	IST	Stem (1) – **see image1** Fragments (2)		*Phragmites* sp. Stem (reedy grass) *Phragmites* sp. Leaf
(10286) Brick ID 37	B52 space 94	4040	Spikelet	Possibly *Triticum* sp. (wheat)	
(10286) Brick ID 54	B52 space 94	4040	Glume (1) Awn Glume (2)		Unident. *Triticum* sp. (wheat)
(10286) Brick ID 69	B52 space 93	4040	Unident. Fragments		*Triticum* sp. (wheat)
(1042) Brick ID 9	Space 160	South	Glume base Spikelet fork	Possibly *Hordeum* sp. (barley) new type spikelet fork	

Grinding-stones
A small selection of grinding-stones were selected from 2006 and 2007 excavation seasons. This work is an assessment for the possibility of future work. The main research question addresses whether there is any evidence for wild food processing. There are clear differences between phytoliths from domesticated cereals as opposed to wild grasses. Recent work with reference material has shown that some phytoliths are produced from Scirpus sp tubers providing the right growing conditions are prevalent. Starch analysis will be undertaken by Dr Karen Hardy. The starch provides particularly useful data on tuber processing versus cereal grains, and in addition can consider non food uses.

Phytoliths from dental calculus and archaeological dung
Samples of dental calculus were taken from sheep, goat and cattle teeth. Teeth chosen were selected with the advice of Nerissa Russell, Katheryn Twiss and Elizabeth Henton. Several studies have successfully extracted phytoliths from dental calculus. It has become clear that dung fuel is a major contributor to some phytolith assemblages - particularly in hearths and middens. Some potential archaeological dung is found in the form of pellets indicating sheep/goat and whether cattle dung was used is less clear. Several samples were taken for me from selected pellets by Mike Charles. Dung from different animals will have varying botanical signatures and the plant microfossils extracted from dental calculus can potentially provide information relating to individual animal diets. Some specific questions include - What phytolith indicators are there for sheep, goat and cattle diet? Is there any evidence for sheep being foddered wheat or barley husks? Are any of these animals eating wetland plants? What wild grasses might be coming onto the site in dung? Analysing the types of phytoliths present in calculus, and more importantly the associations between certain morphologies, aims to provide an indicator for identifying dung fuel in ashy sediment samples. Additionally it is important to know whether high amounts of certain common plant types found on site may be in part related to animal diet.

Discussion
Particularly interesting contexts for phytolith analysis this season included outdoors hearths with in situ ashy deposits. These will contribute to phytolith investigations of fuel use, which considers changes over time and possible usage differences between different types of hearths/ovens. Notable visible remains included the cordage remnants and compressed cereal husks around an antler (14460), remains from a neonate burial basket (16556) South

Area which differed in the usual basketry material used for this type of basket, and a basket (13932) IST Area which appeared to contain grinding-stone fragments. The visible remains from burnt bricks were interesting for showing the diversity of plants used as temper; the amounts of cereal chaff present suggests that large amounts of chaff were collected for this purpose and all the identifiable stems analysed so far (including from 2007) have been from wetland plants with a notable absence of cereal straw. Interesting differences between the different types of midden units within Space 319 are noted (16262, 16260, 15253, 16259) and similarities are seen between these and units analysed from the 2007 season (15728, 15702).

References

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Starch - Renée van de Locht (1), Karen Hardy (2)

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Introduction

Starch-based foods today constitute 50-70% of the global dietary food intake. Evidence in the form of a combination of archaeological remains and ethnographic records suggest that starchy food had an important role in past human diet. All major domesticated plant species are sources of starch for example cereals, rice, and maize (Hardy, Çatalhöyük Archive Report 2007).

Starch is a carbohydrate and occurs in different plant parts as a form of energy storage. It is composed of a mixture of two polymers - amylase and amylopectin – which together form discrete granules (Radley, 1968). The packing of the amylase and amylopectin layers promotes stability, forming a semi-crystalline structure, however, they are easily decomposed by enzymes to water soluble sugars (Hardy, Çatalhöyük Archive Report 2007). Despite this, starch has been found in greatly varying burial environments and from archaeological contexts as old as 180,000 years (Van Peer *et al*. 2003).

As starch granules occur in all green plants it is important to establish that starch found within archaeological features on a site is a genuine signal of ancient human activity.

Aims

The aims of the starch analysis from the 2006-2007 season were to

a) gain insight into the preservation and distribution patterns of starch in varying archaeological features and contexts at Çatalhöyük
b) determine the level of environmental background signal of starch in Çatalhöyük
c) determine the survival of starch in an 'open environment' (archaeological soil) at Çatalhöyük

Fieldwork

Figure 126: Sampling by cork bore of a midden section in area 4040 (space 315, unit 14921) and of a wall in building 65, South area (unit 2514). Photo Starch Team

Samples were collected in 2006 and 2007. The 2006 samples were initially collected for phytolith analysis (by P. Ryan) and were sub-sampled for starch. The 2006 series consist of samples from archaeological features directly related to food preparation and/or storage: ovens, hearth, fire spots and bins (Hardy 2007). The 2007 series consist of a range of background samples not related to food preparation and/or storage such as walls, floors and around burials, mainly from Building 65 in the South Area. Furthermore, samples from a midden section (4040 Area) and an archaeological soil profile (West Mound) were collected. The samples from the West Mound were collected by Genevieve Holdridge.

Laboratory extraction method

Starch is isolated from the samples by heavy liquid separation. Starch has a density of 1.55, by using a liquid with a density of 1.7, a wide margin for error is allowed in order to lose none of the sample.

A small amount (0.02-0.05 g) of sample was placed in centrifuge tubes with 1.0 ml of Sodium Polytungstate (density 1.7). The tubes are centrifuged at 1000 r.p.m for 15 minutes. The starch is then extracted from the surface and washed three times in ultra pure water followed by two rinses with acetone. Samples are then dried. For rehydration and storage a drop of 70% ethanol is added. Samples can then be placed on microscope slides and mounted in Karo corn syrup (2006 samples) or glycerine (2007 samples) for optical observation. The slides are fixed with transparent nail polish to avoid any contact with the atmosphere after slide mounting.

The microscopes used for the optical observations were an *Olympus light microscope IX71* housed in BioArch, University of York, UK and the *Leitz Wetzlar Dialux 20* light microscope housed in the RACM, the Netherlands.

The microscope slides are scanned systematically using magnifications of 10x, 20x and 60x, under cross polarised light initially. This is done because of the high birefringence of starch granules; they appear bright white with a rotating Maltese Cross pattern against a dark background and are thus relatively easily detected on a microscope slide.

To record the starch granules digital photographs are taken with an *Olympus E0430453* camera, The photographs are processed using *ColorView Illu bundle CELL-D* software. Photography and detailed analysis were carried out using an oil immersion lens (Olympus x60) and photographs were taken mostly in DIC (differential interference contrast), and on some occasions under cross polarized light. DIC is used to enhance the contrast of unstained, transparent samples, such as starch samples.

Enzymatic degradation of starch granules

Birefringence is a characteristic found in materials with crystalline layers arranged in a concentric pattern (Hardy et al. 2008). Certain materials can also exhibit extinction crosses. For example Conidia, certain spores of a fungus, exhibit the rotating extinction cross under cross polarized light, and may be morphologically indistinguishable from small starch granules (Haslam, 2005). This particular example may cause a problem when identifying starch granules less then 5 μm in size (Haslam, 2005).

The only safe way to determine whether a granule is actually starch is to degrade it with alpha amylase, an enzyme that is specific for linkages contained in starch (Hardy et al. 2008). Tests with alpha amylase (*B lichenoformus*) injected onto microscope slides with starch granules from Çatalhöyük showed that the samples tested were indeed unaltered starch (Hardy, Çatalhöyük Archive Report 2007).

Results

Morphological classification

From the samples of 2006 and 2007 the following morphological classification was designed, mainly based on the shape and size of granules and on the position of the hilum.

Table 8. Morphological classification of starch granules from Çatalhöyük.

type	description	comments
1	angular; hexagonal, rectangualr, triangular, ≤ 15 µm.	mostly very well preserved, often with visible central hilum.
2	oval/Elipsoid/Bean shaped 10-30 µm.	
3	elongated, average 40 µm.	possibly a tuber species, eccentric hilum
3b	elongated, small, 10-20 µm.	eccentric hilum
4	round, roundisch, 5-15 µm.	often well preserved, high birefringence, central hilum.
4b	round, large, 20-30 µm.	often diminshed birerefringence/blueish, faded appearance
5	round, bimodel distribution of size (A- and B- type granules) large granules average 20 µm, small granules 2-3 µm.	possibly a cereal species
6	large group of very small starches, 1 µm.	cloud of very small starches
7	very small, roundish, ≤ 5 µm.	individual small granules

A preliminary attempt to interpret plant genus was made with two granules types. This will be expanded as more modern reference material is collected. (Figure 127).

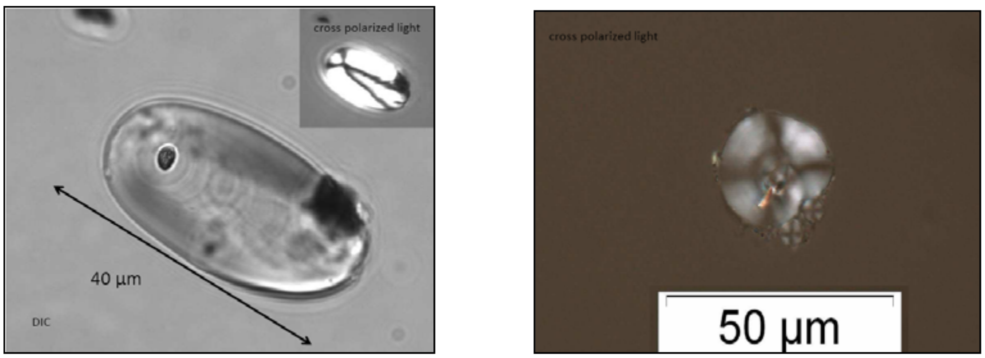

Figure 127: (llef) type 5 starch granules from sample CH07.05: cereal starch (unit 14522, oven floor). (right) type 3 starch granule from sample CH06.26: tuber starch (unit 13079, floor near hearth).

Type 3 starches are large elongated granules (Figure 127). The size and shape of granules such as these suggest it may come from a tuber.

Type 5 starch granules have a bimodal distribution, that is they have two sizes of granules, one small, and one large. Only four plants have this starch distribution, these are wheat (*triticum*), rye (*Secale*), barley (*Hordeum vulgare*) and triticale (*Triticosecale*) (Hardy et al. 2008). Type 5 starches were recorded once in the midden section of area 4040 and in eight of the sixteen samples connected to food production and storage in area 4040 and the South area. In this last sample series the highest abundance of type 5 starches were recorded from features connected to fire use.

Since triticale is a hybrid of wheat and rye, and first bred in laboratories during the 19th century, this could not have been cultivated at Çatalhöyük. Domesticated rye was not found at Çatalhöyük, however non-domestic rye grass (Lulium) grains were recovered. The most likely source of these bimodal granules is barley or wheat both of which were cultivated at Çatalhöyük.

Distribution patterns of starch
The occurrence of the starch types per category of archaeological feature/context is presented in figure 3 (2006 samples) and figure 4 (2007 samples). Each category represents on average 5 samples.

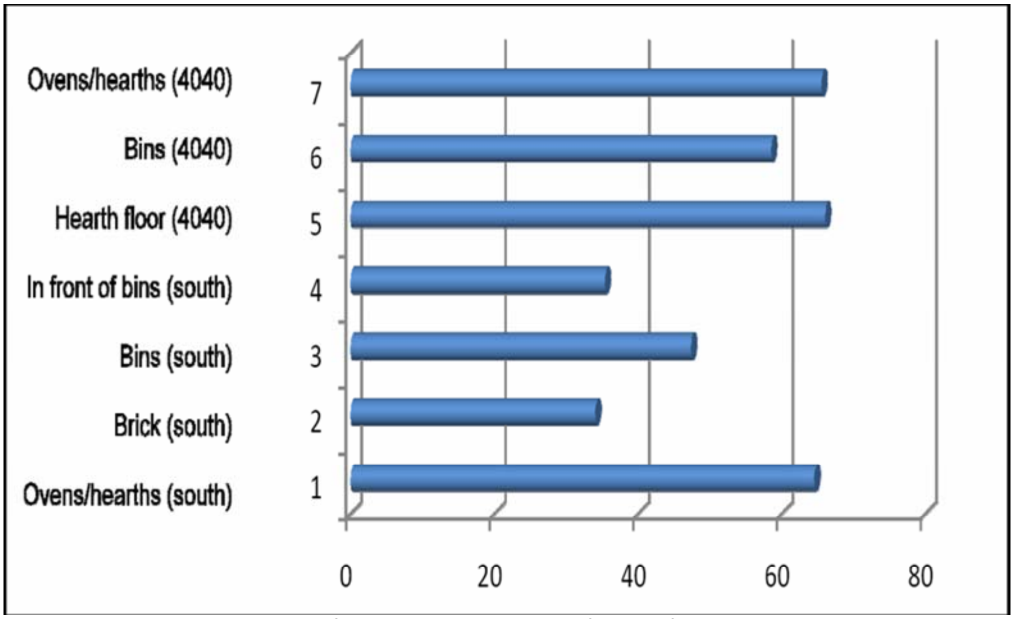

Figure 128: Average abundances of starch per archaeological feature of the 2006 samples. Y-axis indicates the archaeological category, the x-axis indicates the average amount of starch per sample.

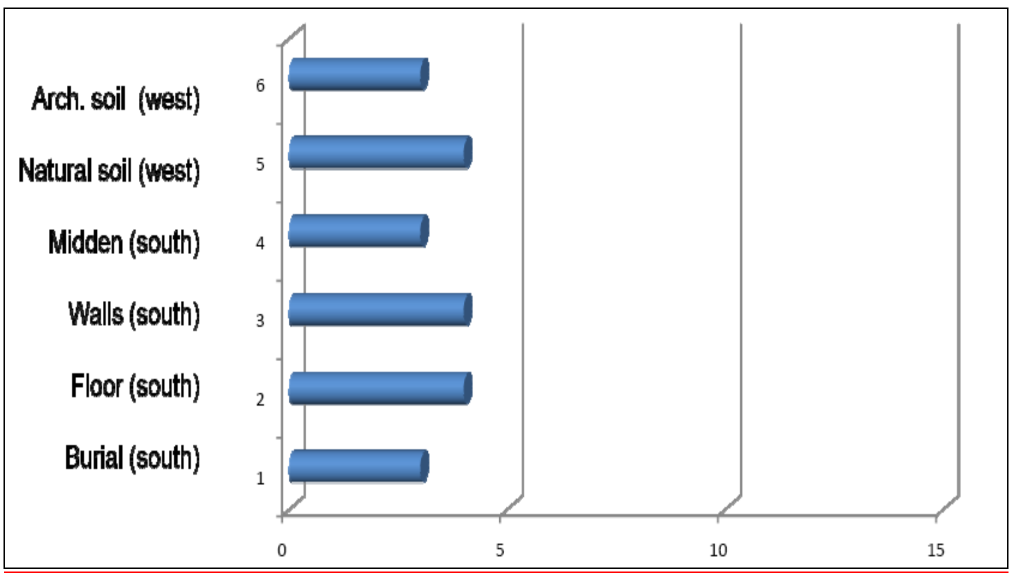

Figure 129: Average abundances of starch per archaeological feature of the 2007 samples. Y-axis indicates the archaeological category, the x-axis indicates the average amount of starch per sample. Note the difference in scale between figure 3 and figure 4.

The samples from Çatalhöyük are divided in two categories: 1) soil/residue samples taken from archaeological features directly connected to food preparation and/or storage, and 2) background samples of walls, floors, middens and archaeological/natural soils.

Analysis of starch shows a clear difference in signal from these two categories. Samples from the first category all contained starch granules in large numbers (28 – 103 granules), covering a wide range of morphologic types and are in a relatively well preserved condition. Category two contains starch granules in most of the studied samples, however, in small quantities (0 – 7 granules), representing fewer morphological categories and often showing relatively high levels of degradation. Category two mainly contained starches from type 1, 4 and 7.

This rather distinct pattern makes it unlikely that the starch population represents random contamination of local vegetation. Category two contains starches common in almost all samples containing starch (type 1 and 4) and these may represent a background signal from local vegetation. However, the high abundance of starch granules in focused category one areas, suggests a genuine signal of ancient human activity related to plant use.

This difference in signal between the two sample categories is underlined by the distribution pattern found in Building 65 of the South Area (Figure 130). The samples taken from Space 298 in this building, and the surrounding bins contain many starch granules in a well preserved state. The wall and burial samples from that same building show an opposite signal: they contain very small amounts of starch, which is often highly degraded.

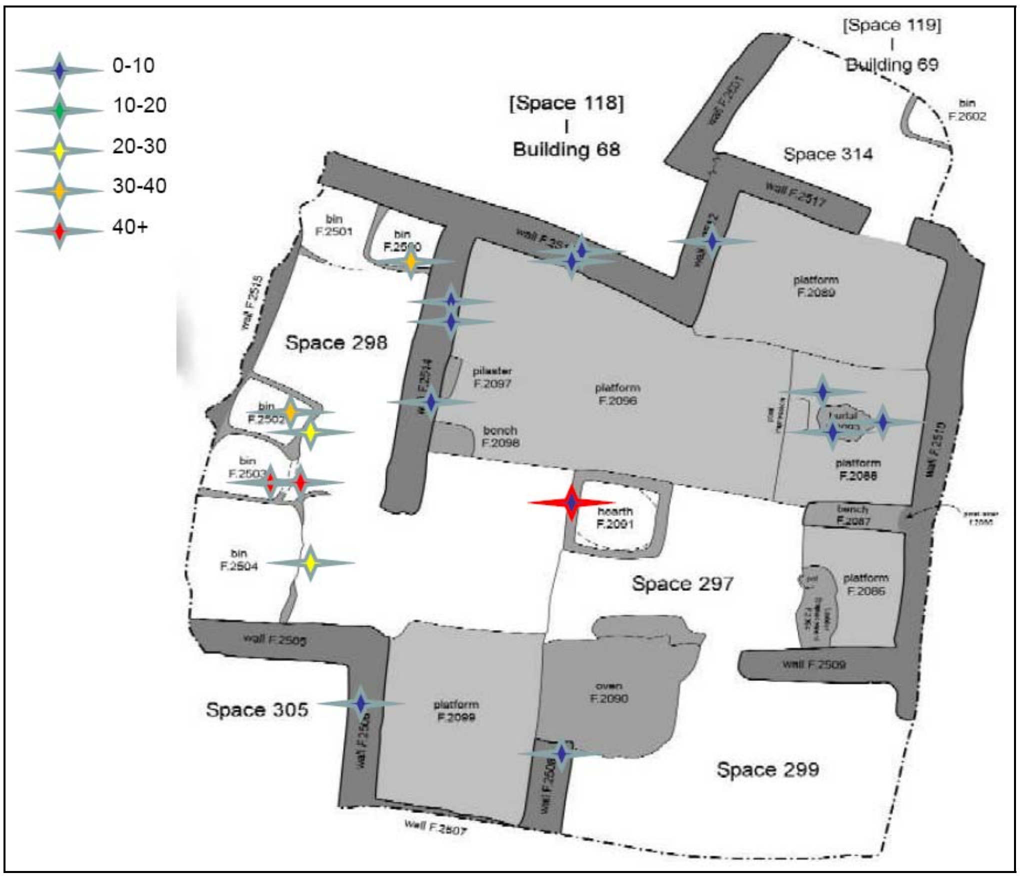

Figure 130: Plan of Building 65 with stars indicating the amount of starches found at those locations. The red and blue star drawn in hearth F.2091 indicates a sample that could not be fully analyzed due to a damaged microscope slide.

Features connected to fire use
The graph in figure 130 shows that the samples from ovens, hearths and fire spots contain the highest abundances of starch within the category of 'food related' archaeological features, from both the South Area and the 4040 Area. A sample from the 4040 Area, from an area in front of an oven (unit 12688) contained the largest amount of starch granules in this study (103 starches).

West Mound profile
On the West mound samples were taken to examine the distribution of starch through the archaeological levels from different time periods and from the non-archaeological soil beneath and the top soil above (Figure 129). Within the archaeological layers no features with connections to food storage and/or preparation were sampled.

The analysis revealed an almost homogenous distribution of starch throughout the dwelling mound. All archaeological levels (Late Neolithic, Early Chalcolithic and Historic) contained starch granules. In addition, both the natural soil below and the top soil contained starch. However, there were only a few starch granules per sample, representing a limited range of morphological categories many of which were in a degraded state. No link could therefore be made between relative abundances of starch and different stratigraphic levels. This suggests these starches represent a background signature.

Discussion and conclusions

Starch has been retrieved from a large number of samples (51) from different archaeological contexts of the site of Çatalhöyük. From the recovered starch granules a morphological classification based on shape, size and other characteristics has been generated. Seven main categories and two sub-categories have been identified. Ultimately the morphological appearance of starch granules has led to the probable identification of a cereal species and a tuber species. The cereal starches are probably from wheat or barley. Further identification of the tuber starches will be conducted following compilation of a modern reference collection.

The pattern of distribution seen in the features related to food preparation and/or storage as opposed to background samples has been attributed to two facts: 1) starches have preserved in these features because they were present in great numbers when entering the archaeological record due to activities related to food preparation and storage, and accumulation over time, 2) they have been preserved here in great numbers because of profitable preservation conditions.

Point one underlines the fact that we have recorded an authentic signal of human activity related to plant use, and not a random environmental signal contaminating the site. The second point is related to human activities such as cooking and the effect of micro environmental protection on organics, by for example soil aggregates which have been recorded by archaeologists in and surrounding the bins in Building 65, South Area (Çatalhöyük database). Small soil aggregates can physically isolate organics from decomposer organisms (Haslam, 2004). This was also observed in Kaman Kalehöyük through micromorphological analysis of archaeological soil (Van de Locht, 2008). However, no such analysis was conducted here and therefore no conclusions can be drawn on this subject at present.

The background samples from the walls of Building 65, the midden, and the West Mound profile showed starch granules which were often highly degraded. The susceptibility of starch granules to enzymatic attack depends on several factors: the structure of the crystalline areas in the granules, the amylase content, the enzymes in question, the length of time of the attack and granule size (Bhat et al. 1983; Franco & Ciacco, 1992; Gallant et al. 1992; Baker and Woo, 1992). Baker and Woo (1992) found that large granules are more susceptible to enzymatic attack then small granules.

Enzymatic attack in the form of endocorrosion can lead to the digestion of the interior of granules, causing loss of birefringence at the hilum (Gallant et al. 1992; Leach & Schoch, 1961). Starch granules with total loss of birefringence at the hilum were frequently recorded in the wall samples, midden samples and the West Mound profile (Figure 131). This, and the occurrence of mainly small granules, may be the result of high levels of enzymatic degradation, especially endocorrosion, in these archaeological features.

The features connected to food preparation and storage did not contain starch granules with total loss of birefringence at the hilum. A few granules did show cracks or fissures, showing degradation did take place, however in a considerably less severe rate than in the background samples (Figure 131).

An explanation for the high amounts of starch granules within deposits connected to fire is that initially a lot of starch may have been deposited because such areas are connected to cooking and other food processing activities.

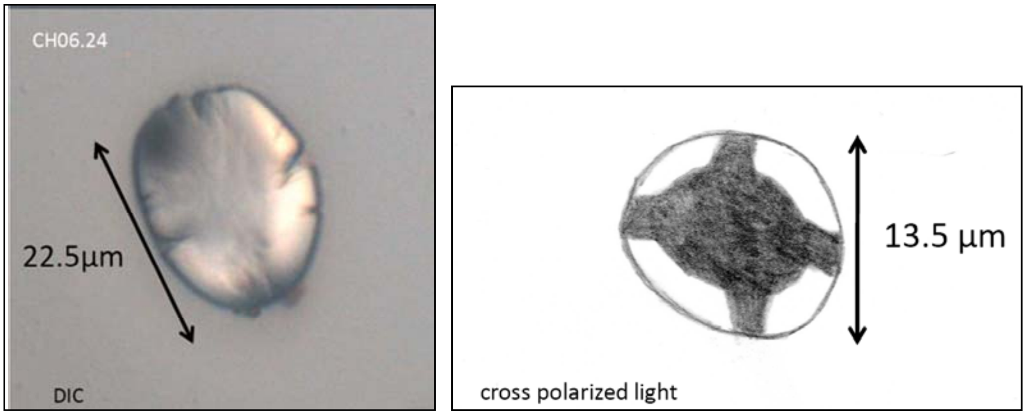

Figure 131: Left: cracks on the edges of a starch granule. Right: drawing of a starch granule affected by endocorrosion after example of starch granules from samples of the west Mound (no such granules could be photographed in focus).

Heating and charring of starch may help its preservation. This could be caused by gelatinization and subsequent retrogradation which leads to more resistant starch granules (Hardy et al. 2008) though heating without the presence of water (roasting) doe not necessarily destroy starch granules either. It must be noted however, that gelatinization and retrogardation are not studied here, therefore we cannot be sure whether this process played a role in these contexts. However it may help explain the correlation between starch abundance and features connected to fire use within Çatalhöyük. More research is needed on this topic.

Two explanations could be given for the relatively homogenous distribution pattern of small amounts of degraded starch granules in the West Mound profile.

Firstly, one could argue that the starch found in this profile is of anthropogenic nature and that through movement in the soil starch granules have been deposited in the different levels, including the natural soil beneath the dwelling mound. This movement could be caused by soil particles moving downward due to groundwater movement and/or by bioturbation. The last includes possible movement upwards. This movement of starch through soil profiles due to groundwater fluctuations may to be more or less restricted to smaller starch granules (Therin, 1999). The starch granules found in this profile were all small (type 1, 3b and 4 which are about 10 to 15/20 µm and type 7 which is only 1 to 5 µm in size). Further work is required to determine whether mass transportation has taken place, and whether the profile has been disturbed by bioturbation.

It is equally possible that starch found through the West Mound profile is a background environmental signal as it can be transmitted to the soil through plant remains from the local vegetation.

Since these starch granules are distributed throughout the soil and are not in direct association with an artefact and its potentially protective micro environment, this could explain the degraded appearance of most of the starch granules from this profile. It is probable that most starch granules from the profile have disappeared due to degradation.

Reference material

Morphological identification of starch is carried out based on comparison with a reference collection. A reference collection both of starchy tubers and cereals is being created from material housed in the Institute of Archaeology, London and from field collection. in order to expand the samples of potentially edible tubers.

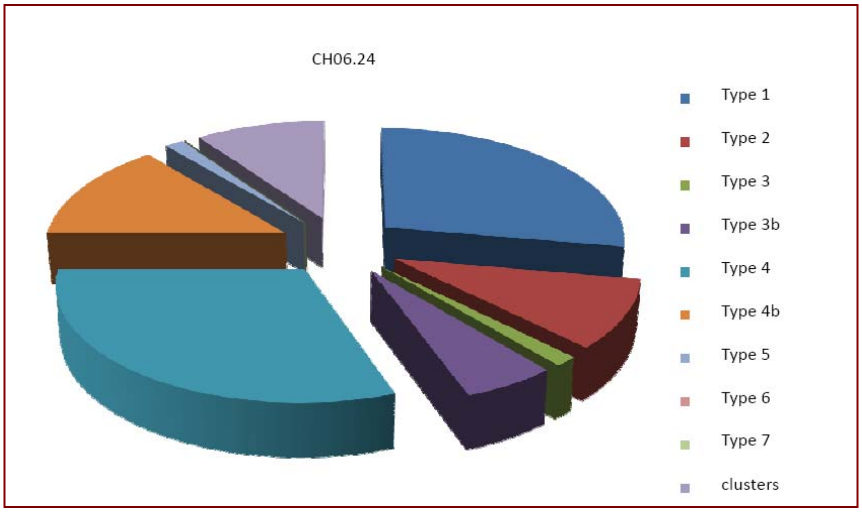

Figure 132: Chart showing the relative abundances of starch granules per morphologic category from sample CH06.24 (South area, unit 12529; hearth rake out in midden section).

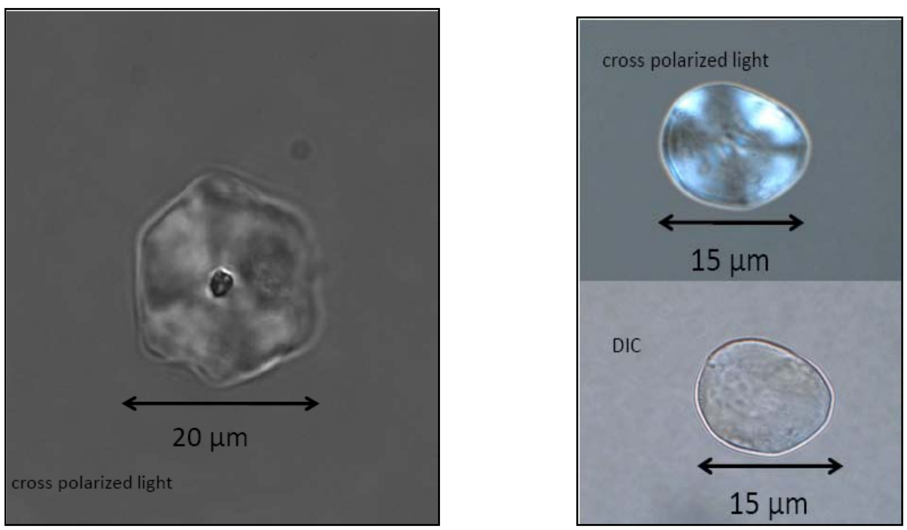

Figure 133: (left) starch type 1 from sample CH06.022 (unit 13358, South area, building 65, lip of oven). (right) starch type 4 from sample CH07.91 (unit 15115, West Mound, late Neolithic).

Acknowledgments
Thanks to Ian Hodder for welcoming us at Çatalhöyük and to Shahina Farid for her help in organizing the trip. The members of the Çatalhöyük team are greatly thanked for providing the samples, especially Phillipa Ryan for the 2006 samples, Roddy Regan and Genevieve Holdridge for the 2007 samples. We are indebted to Dr. Osman Tugay for his help in collecting wild edible plants in the country side surrounding Konya.

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Shell archive report 2008 - Daniella E. Bar-Yosef Mayer (1) & Burçin A. Gümüs (2)

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Introduction

In the summer of 2008 we began a study of all molluscan remains from Çatalhöyük.

This fauna will be studied in coming years, and will be incorporated into the digital database. This first season of study was dedicated to learning the systems involved in recording as well as getting acquainted with the site and its stratigraphy, and with the malacofauna present at the site and around it.

Most shells discovered up to 1999 were previously studied by D.S. Reese (2005), therefore we started by studying the shells discovered in later seasons.

Shells commonly found in archaeological sites belong to one of three molluscan classes: Gastropods (snails) that naturally inhabit marine, freshwater or land environments; Bivalves that naturally inhabit marine and freshwater environments; and Scaphopods (tusk shells) that inhabit only marine environments. All these groups are represented at Çatalhöyük. Similar to vertebrate fauna, shells were used as food, as raw material for making ornaments or tools, and may reflect the natural environment of the site during its occupation. We plan to explore all these possibilities in relation to the spatial and stratigraphic context of the finds.

This initial archive report presents general observations and preliminary results.

Methods
Studying molluscs involves identifying the species, studying their taphonomy and identifiying human manipulations, and analyzing the finds. Species identification was based in the field on comparison to various publications. Several marine species that we were not able to identify were exported to Israel's national mollusc collection, where they underwent preliminary identification by Mr. Henk K. Mienis, an internationally renowned malacologist. Scaphopods underwent initial identification by Ms. Aldona Kurzawska at the Polish Academy of Sciences, Poznan branch.

Following species identification the shells were described taphonomically. This was done with the help of a typelist that distinguishes between complete shells, broken shells (where more than half the shell is present), shell fragments (where less than half the shell is present), worked shells, and specific products of worked shell that are "fitted" to certain species. Whenever possible we noted other parameters, such as working methods of perforated shells, whether they were coloured, and complete artefacts were measured.

In the case of freshwater bivalves that are assumed to have served as food and are very fragmented, it is critical to be able to calculate MNI (minimum number of individuals), as opposed to NISP (number of identified specimens) that is adequate for the rest of the molluscan fauna. Thus, we distinguished between right and left valves in the remains that include the umbo (whether fragments, broken valves or complete ones). The larger number of valves (right or left) determined the MNI (Figure 134).

Figure 134: Right and Left valves or Unio sp. Photo Shell Team

Freshwater bivalves and gastropods were measured with a digital caliper whenever possible. In freshwater bivalves that were complete (i.e., had conjoining valves) we measured height, length and convexity. Individual valves were measured for height and length whenever possible.

Species listed as artefacts in Table 9 refer to shells that were manipulated to serve as beads and ornaments or were painted, or were collected as ready-to-use beads (Francis 1989). In the case of Unio, artefacts were counted separately, so that they are not included in the MNI, but are included in the NISP.

Figure 135: Cassidae painted red.

Results
The results presented below are listed by the origin of the shells, and summarized in Table 9 in taxonomic order. Marine shells that were obtained either directly by the inhabitants of Çatalhöyük, or by exchange with other groups, were brought from the Mediterranean. Other marine shells, initially suspected as originating in the Red Sea, are now (following consultation with H.K. Mienis) thought to represent a Miocene fauna from fossil exposures in other parts of Turkey. Those have not yet been determined. Freshwater shells and landsnails are from the vicinity of the site.

Marine And Fossil Shells
Gastropods:
Seventy-eight gastropods belong to about eleven taxa. The species brought from the Mediterranean could have served as simple beads as most of them are naturally or artificially perforated. Seventeen of 25 Columbella, and all nine Nassarius had a hole that could be used for suspension.

Figure 136: Osilinus turbinatus : Broken shell and artefact.

Most of the shells of fossil origins, including Strombus, Cassidae, Turitella, and Fasciolariidae are complete or broken. One Cassidae was perforated with a hole in the apex, and another was painted red (Figure 135). One Fasciolariidae shell had two holes in the body whorl. It is not clear what was the purpose of collecting the rest of the shells from this source or sources. Persististrombus coronatus, a very large fossil (Harzhauser and Kronenberg 2008) measured 67 mm long and the spire was painted red (13127.L1).

One should note in particular an unusual artefact made of Osilinus turbinatus, was found as three fragments that were repaired at the conservation laboratory. No parallels are known of this type of artefact (Figure 136), which is a ring cut out of the spire of the pearly Osilinus. It was found on the West mound (13743.x3) in a grave fill, and might be as late as the Roman period when mother of pearl artefacts were very popular (Michaelides 1995).

Bivalves:
Only 7 marine bivalves were recorded. One is a broken valve of Arca noae, another a fragment of a valve from family Cardiidae. Both could originate in the Mediterranean. Additional shells could be fossil and await further identification. Those are two specimens of Anadara and two specimens of Ostrea. The seventh item is an artefact made of a large and heavy Glycymeris that could also be a fossil. It is cut into a triangle, and in the centre of its concave side there is a partially drilled hole, 6.3 mm in diameter. The artefact is 33 mm long and 8 mm thick, and it was ground in a few places on its convex side to be flat (Unit 15549, Trench 8).

Scaphopods:
Scaphopods, or tusk shells, are known to most archaeologists as Dentalium (Bar-Yosef Mayer 2008). Scaphopods usually live in depths of 30 m or more, both in the Mediterranean and in the Red Sea. They are also known in archaeological sites to be collected from fossil exposures (Avnimelech 1937, Stiner and Kuhn 2003, Vanhaeren et al. 2004).

At least three different species of scaphopods were encountered. The two main groups are Fissidentalium rectum that are robust ribbed shells, apparently fossil (Steiner & Kabat, 2004), and Antalis dentalis that are finely ribbed and smaller shells, from the Mediterranean. It should be noted that it is hard to differentiate between Antalis dentalis and Antalis inaequicostata and these Mediterranean species will be from now referred to as Antalis dentalis group (Kurzawska et al. in preparation). The third group is that of unidentified scaphopods.

TABLE 9

	species	origin	NISP	MNI	artefacts
Gastropod	Osilinus turbinatus	Mediterranean	8	4	1
	Turitella spp.	fossil	3	3	
	Strombus	fossil	1	1	1
	Cypraea sp.	Mediterranean	5	5	2
	Cassididae	fossil	8	8	2
	Phalium	Mediterranean	1	1	1
	Muricidae	Mediterranean	1	1	
	Columbella rustica	Mediterranean	25	25	17
	Nassarius gibbosulus	Mediterranean	9	9	9
	Fasciolariidae	fossil	6	6	1
	Conus mediterraneus	Mediterranean	10	10	7
	Conus sp.	fossil?	1	1	
	Theodoxus fluviatilis	Freshwater rivers and lakes	87	81	9
	Viviparus viviparus	Freshwater rivers and lakes	435	328	17
	Lymnaea stagnalis	Freshwater shallow	1	1	
	Stagnicola palustris	Freshwater shallow	32	18	1?
	Radix auricularia	brackish water	1	1	
	Planorbis carinatus	Freshwater lakes	4	4	
	Gyraulus albus	Freshwater lakes	143	143	
	Planorbarius corneus	Freshwater shallow	29	11	
	Melanoides sp.	Freshwater	1	1	
	Vallonia sp	land	1	1	
	Chondrula sp.	land	2	2	
	Monacha (Paratheba) rothii	land	35	18	
	Xeropicta derbentina	land	70	70	34
	unidentified landsnails	land	43	1	
	unidentified gastropods	unknown	10	10	1
Bivalvia	Arca noae	Mediterranean	1	1	
	Anadara	fossil?	2	2	
	Glycymeris	fossil?	1	1	1
	Ostrea	fossil?	2	2	
	Cardiidae	Mediterranean	1	1	
	Dreissena	Freshwater	33	16	
	Unio pictorum	Freshwater rivers	3968	987	64
Scaphopoda	Fissidentalium rectum	fossil?	8	8	8
	Antalis dentalis	Mediterranean	3	3	3
	scaphopoda	unknown	18	18	18
TOTAL			**5009**	**1803**	**196**

Figure 137: Dentalium sp. with cutmarks.

Overall we recorded 29 scaphopods ranging in size from 0.9-24.2 mm in length, with an average size of 4.7mm. Ten of the shells are heavily abraded. One shell, the largest in the group (Unit 10039), is of special interest as it has several incisions around its perimeter indicating attempts of cutting it to make shorter beads (Figure 137).

Freshwater shells

Freshwater shells consist of two bivalve species and eight gastropod species. While most were collected from the excavation sediments, we also observed some embedded within mudbricks and mortar. Table 10 presents the shell species present in a few of the walls that we examined. It is clear that all of the malacofauna associated with construction material

originated from active streams. The fragmentary nature of the Unio, especially in the mortar, causes us to suspect that it could be a secondary deposit from a midden at the site. This study is conducted in consultation with Serena Love.
Freshwater shells, however, were very prominent throughout the site and form the largest malacological component.

Gastropods
Theodoxus fluviatilis (Linnaeus, 1758): This species lives in the freshwater river systems and lakes, which were derived from the inner freshwater lake (the continuation of the Tethys) in the Eocene (55-36 million years before). This finding supports the paleogeographical construction of the region that the Çarşamba River derived from the inner freshwater lake that was surrounded by the Black Sea Region Mountains in the North and the Taurus Mountains in the South of Anatolia (Demirsoy, 1999).

Viviparus viviparus (Linnaeus, 1758): The second largest group of shells belongs to the genus Viviparus. In a few specimens holes were ground down in the body whorl, probably to be used as ornaments. While studying the shells we had the impression that shells from the upper levels of the excavation differ morphologically and we therefore measured all shells studied. The results will be presented upon completion of the study.

Additional freshwater gastropods, listed in Table 9, represent at least four habitats: lakes, rivers and active streams, low energy or standing/seasonal waters, and one species, Radix auriculata (represented by only one specimen), is adapted to a brackish water environment. Further analysis of these species in their stratigraphic context may provide further environmental information.

TABLE 10

		Wall a		**Wall b**		**Wall c**	
species	**environment**	mudbrick	mortar	mudbrick	mortar	mudbrick	mortar
Theodoxus fluviatilis	Freshwater rivers and lakes	x		x	x	x	
Viviparus viviparus	Freshwater rivers and lakes	x					
Melanoides sp.	Freshwater ??				x		
Unio pictorum	Freshwater rivers		x	x			x

Bivalves
Two freshwater bivalve species were identified: Dreissena sp. and Unio pictorum. Unio pictorum (Linnaeus, 1758): Because the site is situated between the channels of the Çarşamba River, it is not surprising that this species constitutes the overwhelming majority of shells at the site (90%). This edible freshwater species was most likely consumed by the inhabitants of the site. The discarded valves were often included in the construction material (Table 10) and also used as the ornaments.

Land snails

Figure 138: Shell tempered pottery sherds.Photo. Shell Team

Vallonia sp.: Several specimens were found embedded in ceramic pieces from TP (Unit 15279)(Fig 138). It is as yet unclear whether they are intentional temper or were included with the clay.

Chondrula sp.?: A few broken specimens were found but it is impossible to identify the species the aperture is absent.

Xeropicta derbentina (Krynicki, 1836): Sixty nine specimens were found in the South Area (Unit 11691. "Cluster placed deposit of a shell necklace inserted prior to blocking of niche at the north west of Building 56, blocking deposit (11690) sat directly over this...”), and of those 34 were had holes in the body whorl (Figure 139). It is not clear whether the holes were made artificially to be used as ornaments, or whether they are the result of predation (possibly by rodents).

Figure 139: Holed Xeropicta derbentina.Photo Shell Team

Recent fauna

The area around the West and the East Mounds was surveyed on the 20th of August, 2008. We collected fresh water pulmonates (Radix sp., Gyraulus sp.) from the old riverbed of the Çarsamba River, and a terrestrial pulmonate (Monacha sp.) from the fields around the site. In the study planned for the environmental reconstruction, we will use those for comparison, along with information from the ancient terrestrial species (and see Gümüs 2006).

Conclusions

Shells were exploited at Çatalhöyük in every possible way: The most common finds are Unio bivalves from the nearby Çarsamba river (most likely, that will be confirmed with isotopic studies planned in the future). They were used primarily as a food source, and secondarily as a source of mother of pearl ornaments. A few river shells, both Unio and gastropods were painted red. Since those were not perforated, it is not possible to determine that they were ornaments, but they most likely played a role in the spiritual lives of the inhabitants of Çatalhöyük.

Table 11: Frequency of shells at Çatalhöyük by their origin based on MNI

Origin	N (MNI)	%
Mediterranean	60	3%
fossil	32	2%
local freshwater	1591	90%
local land	92	5%
Total	**1775**	**100%**

Personal ornaments and jewellery were made not only of local material (Unio, Viviparus, and possibly Theodoxus and Xeropicta), but also from imported shells. Those consist of marine and fossil shells that were either used in their natural state (as in the case of scaphopods and naturally holed gastropods), or were perforated and/or painted. Locating their origin will enable us to reconstruct the ties that the Çatalhöyük inhabitants had at different periods with other parts of Turkey. Whether they themselves inhabited those areas (during certain seasons?), or whether they simply maintained ties with other populations, remains to be seen.

Terrestrial species from variable environments that are represented by sixteen species from land and aquatic sources will enable us to pursue an environmental study.

Final remarks: It is our impression that a large number of the marine shells come from 4040 Area, however, this may be biased due to the way in which we selected shells for study. It is also our impression that most Unio samples are from the South Area, but here again, it is premature to determine until a more detailed study is carried out.

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2008 Pottery Archive Report - Nurcan Yalman, Hilal Gültekin, Duygu Tarkan

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The total number of the pot sherds, bigger than 2 cm (body and diagnostics) is 1171 and smaller than 2 cm is 2525 recovered from the East mound for 2008 season. This year the excavation concentrated mostly on building spaces rather than open areas and middens. Therefore the amount of the pottery is lower than the previous years when the excavations focused on large middens especially in the 4040 Area. But still the largest amount of sherds were from midden spaces. Here we report on the pottery found in the 4040, South and IST areas.

Area	Body Sherds	Diagnostic Sherds	UnIdentified Body Sherds
4040	50	11	99
South	903	271	2381
IST	68	18	55

4040 Area
The spaces excavated in 2008 are:
Sp 335 (B.49), Sp 336 (B.77), Sp 337 (B.77), Sp 271 (External Space) and Sp 60 (External Space) and Sp 84.

Building 49, Space 335:
Only two units from Sp. 335 yielded pottery this year. These are (14460) (platform construction but also described as "loose ashy layer in sw corner of B.49, Sp.335. Note: Horn core between x15 and x16 measured 55 mm x 160 mm. Excavated as 7957 in 2004. Either imported midden OR house clearance episode with material dumped in corner" (from exca.database) and (14482) (platform construction). One rim sherd was found in (14460), Dark Mineral Shell Like Ware (DMS-sh) in a bowl shape but not diagnostic of the pottery sequence. In (14482) were 5 body sherds from a 20lt volume and all of them Dark Mineral Ware with orange coloured paste (DMSop). These are probably fragments of a single larger piece. As a result, it is obvious that building units do not have primary or even secondary pottery finds except these 6 sherd, and it seems that they have come into the building with dump or construction material.

Space	Feature	Unit	Ware code	Total	Weight	Sherd	Interpretive category	Totalvolumedeposit
335	2008	14482	DMSop-m1	5	122	BODY	,platform construction,	20
335	4006	14460	DM-sh-op1	1	7.6	BW8	,Platform construction,	120

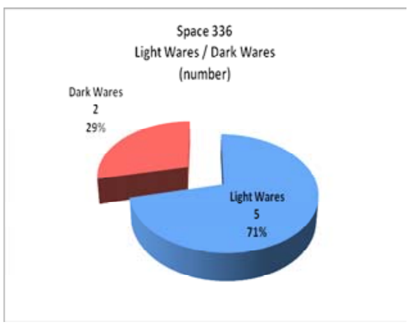
Building 77
There are three spaces with pottery in this building; Sp.83, Sp.336 and Sp.337.

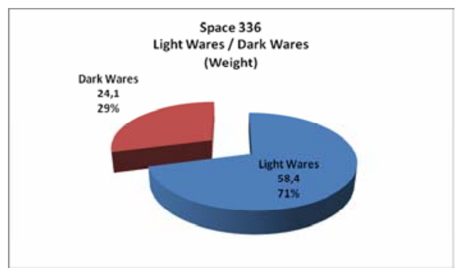
Space 83:
Unit (16401) has only one sherd that is LT (Late Periods), because the unit is the top layer of the building infill.

Space	Feature	Unit	Ware code	Total	Weight	Sherd	Interpretive category	Totalvolumedeposit
83		16401	LT	1	8.6	BODY	,room fill,	240

Space 336:
There is pottery from four units and none are from primary or secure contexts (see Table 3). The room fill /collapse units (16415),(16425) have four sherds, 2 of them are diagnostic pieces; one Dark Mineral Standart Ware rim sherd and one a Cream Mineral Ware base sherd. The brick rubble fill (16479), 4560lt in volume, has got 2 sherds again from the light ware groups. Overall the light ware seems to dominant this small group of sherds in this space.

Unit	Ware code	Total	Weight	Sherd	Interpretive category	Totalvolumedeposit
16425	DMS-sh1	1	13.9	BODY	,room fill / collapse,	160
16425	OPL-m2	1	11.5	BODY	,room fill / collapse,	160
16479	CM/OP-m1	1	12	BODY	,brick rubble fill,	4560
16479	RP-m1	1	9	BODY	,brick rubble fill,	4560
16495	CO-m2	1	7.7	BODY	,clay layer,	435
16415	DMS-m1	1	10.2	BW8	,collapse/fill,	285
16425	CM-s2	1	18.2	B20	,room fill / collapse,	160

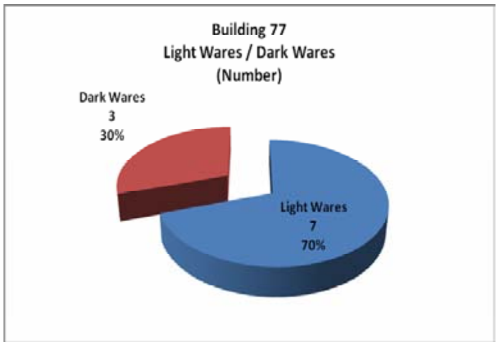


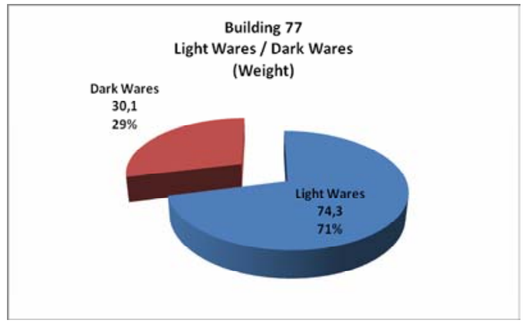


Space 337:
Three units have pot sherds in this space. One of them is a room fill. Only 2 sherds were in 810 lt volume. Two units are slightly different than the other mixed contexts: these are a fill of a pit cut and a bin fill. The former (16430) yielded one sherd and it is CHA (Chalcolithic) the latter (16488) is infill in an empty bin F.3092, the pot fragment is a rim sherd from OPD (Orange Paste Dense Ware) group and a bowl piece. The orange colour and the dense structure of the sherd might have happened during the fire in the building.

Space	Feature	Unit	Ware code	Total	Weight	Sherd	Interpretive category	Totalvolumedeposit
337		16430	CHA	1	1	BODY	,fill of pit cut,	110
337		16453	DMMop-m1	1	6	BODY	,room fill,	810
337		16453	OPD-f1	1	6.9	BODY	,room fill,	810
337	3092	16488	OPD-f1	1	9	BW3	,bin fill,	860

Conclusion for B.77
In B.77, the total number of sherds are 12 and 10 of them belong to the Neolithic period.
The light ware percentage is clearly higher than the dark ware that may indicate the end of the middle levels, such as Level IV. But the other option to explain this percentage of the light ware can be the fire effect on sherds. The high temperature may cause the colour change, the small number of the sherds and having only two diagnostic pieces does not allow us to say more. But this situation itself denotes the idea of the elaborated houses are cleared from pottery and all the pottery found from the units of these buildings are either mixed or room fill contexts but not insitu or in primary deposits.

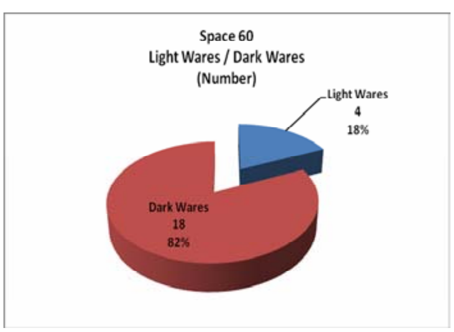


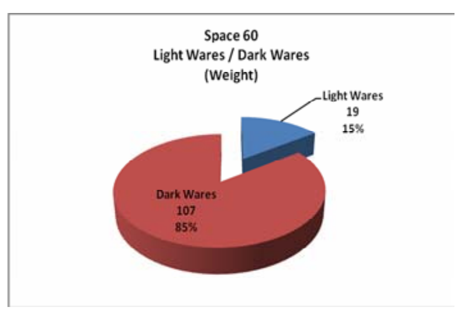


Space 60:
This external space has got five units which contain pottery. The total volume of these units is 2950 lt and the total number of the sherds that is found in these units are 22. All units are midden,eroded midden and external dump layers, except (16731, eroded brick layer).

Space	Feature	Unit	Ware code	Total	Weight	Sherd	Interpretive category	Totalvolumedeposit
60	4054	16726	DMSop-c1	1	5	BODY	,Eroded Midden Fill,	1230
60	4054	16728	DMS-sh1	6	42	BODY	,midden,	680
60		16731	DMS-m1	1	9.1	BODY	,Eroded brick layer,	230
60		16741	DMS-sh1	9	49	BODY	,External dump layer,	810
60		16741	RP/DMS-m	2	13	BODY	,External dump layer,	810
60	4054	16728	DMSop-c1	1	11	H7	,midden,	680
60		16737	OPD-m1	1	6	BW.Unl	,external dump,	430
60		16741	CM-f1	1	2.3	MnRT+MnT11c	,External dump layer,	810

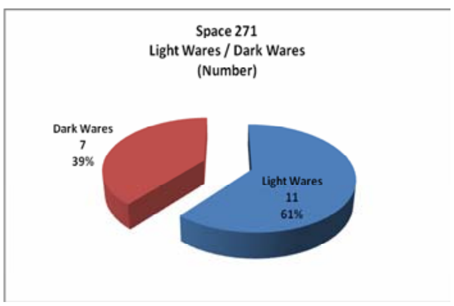
The sherds from these midden type layers is small compared to other middens in the 4040 Area excavated in previous years. The dominancy of Dark Wares should be noted and within the Dark Wares the DMS-sh (Dark Mineral Shell Like) ware (%67) has got the highest number. But we should remember that the statistics are made on 22 sherds (very little for a better understanding). The existence of one miniature bowl and the Dark Ware dominance may indicate Mellaart Level VI-V.

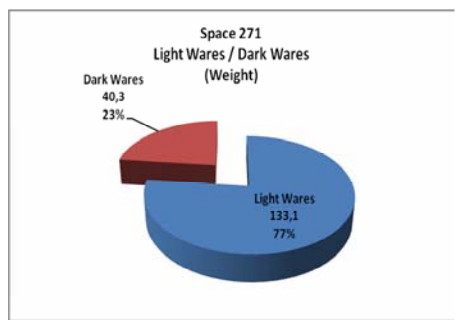




Space 271:
This area looks like the southeast end of a ‘street’ or ‘alley’ with Sp. 60 at its west end and in plan they appear to be continuous of each other. But the pottery content gives different results. There are 16 sherds but 4 of them are LT (Late); 12 Neolithic sherds shows a dominancy in Light Ware. But it is again a very small amount to get a reliable result. The increase in CM (Cream Mineral) ware may indicate Level V.

Space	Feature	Unit	Ware code	Total	Weight	Sherd	Interpretive category	Totalvolumedeposit
271		14188	OPD-m1	1	12	BODY	,Eroded mud brick rich layer,	1580
271		14188	LT	1	2	BODY	,Eroded mud brick rich layer,	1580
271		14191	CM-s/K-m1	1	10.9	BODY	,External dump deposit,	1480
271		14191	DMSop-f1,4	1	5.7	BODY	,External dump deposit,	1480
271		14191	LT	3	9	BODY	,External dump deposit,	1480
271		16716	CM-s2	3	31.1	BODY	,External dump layer,	2340
271		16716	DMS-f,m	2	23.6	BODY	,External dump layer,	2340
271		14188	CM-s1	1	17	T4	,Eroded mud brick rich layer,	1580
271		14198	CM-s1	1	23.6	UnI	,Midden fill cut,	150
271		16716	CMO-s2	1	14.5	UnI	,External dump layer,	2340
271		16716	CMO-s2	1	10	UnI	,External dump layer,	2340





Space 84:
The single unit excavated in this space is grave fill of a late burial, and the only pot sherd found in this space is also a LT (Late) period one.

Space	Feature	Unit	Ware code	Total	Weight	Sherd	Interpretive category	Totalvolumedeposit
84		16444	LT	1	6	BODY	,grave fill of late burial,	180

Conclusion for 4040 External Spaces:
The external spaces excavated this year (Sp 60 and Sp 271) represent different characteristics than the midden areas excavated in previous years. The biggest difference is the amount of the pottery. These external spaces are very poor in pot sherds. Although middens (e.g. Sp 286) generally shows mixed and disturbed layers, it is still possible to see a statistical consistency and the large numbers of pot sherds help that situation. The explanation for the small number of pot sherds may be related to the usage of these spaces. Sp 60 and Sp 271 have units interpreted as dump/midden etc. we need to explore the reason for this differentiation. These spaces may have been used as passage rather than being refuse areas.

South Area

Building 44, Space 319:
The units that contain pottery in this space are (16271), (16559) and (16578). All of these units belong to B.44 construction elements, such as mortar and levelling. There are 34 Neolithic and 1 Late sherds recorded in these units that belong to Sp 319.

The number of sherds in some cases is actually more than the number of sherds found within the building living spaces. Therefore we can qualify the number as “high”, especially for mortar or levelling contexts. That is probably the recurrent situation of using the midden deposits for these kind of purposes (for construction). Under these conditions these are not reliable contexts.

Space	Feature	Unit	Ware code	Total	Weight	Sherd	Interpretive category	Totalvolumedeposit
319		16253	CM	2	40	BODY	,midden,	570
319		16253	DMS-f,m	16	136	BODY	,midden,	570
319		16253	DMS-c1	3	44	BODY	,midden,	570
319		16253	DMB-m1	1	12	BODY	,midden,	570
319		16253	DMSop-m1	3	25	BODY	,midden,	570
319		16253	DMS-sh1	3	37	BODY	,midden,	570
319		16253	DM-sh-op1	1	16	BODY	,midden,	570
319		16253	DMB-m1	1	12	BODY	,midden,	570
319		16253	DMCop-f1	1	7	BODY	,midden,	570
319		16253	DMM-m2	2	12	BODY	,midden,	570
319		16253	OPD-m1	2	51	BODY	,midden,	570
319		16253	OPL-c1,3	1	9	BODY	,midden,	570
319		16253	W-m2	2	19	BODY	,midden,	570
319		16253	LT	5	27	BODY	,midden,	570
319		16258	CMB-m1	3	22	BODY	,midden,	470
319		16258	DMB-c1	1	36	BODY	,midden,	470
319		16258	DMB-m1	9	109	BODY	,midden,	470
319		16258	DMC-m1	2	22	BODY	,midden,	470
319		16258	DMM-m1	1	27	BODY	,midden,	470
319		16258	DMS-c1	3	63	BODY	,midden,	470
319		16258	DMS-m1	10	112	BODY	,midden,	470
319		16258	DMSop-m1	2	17	BODY	,midden,	470
319		16258	LT	2	5	BODY	,midden,	470
319		16258	OPB-m1	1	7	BODY	,midden,	470
319		16259	CMB-f6	1	7	BODY	,0,trodden surface,	90
319		16259	DMS-m1	2	22	BODY	,0,trodden surface,	90
319		16259	OPB-f1	1	6	BODY	,0,trodden surface,	90
319		16260	CM	7	94	BODY	,Midden,	630
319		16260	CMB-s1	1	16	BODY	,Midden,	630
319		16260	DMB-m1	13	116	BODY	,Midden,	630
319		16260	DMBop-m1	3	42	BODY	,Midden,	630
319		16260	DMM-c1	3	46	BODY	,Midden,	630
319		16260	DMM-m1	4	49	BODY	,Midden,	630
319		16260	DMS-	3	24	BODY	,Midden,	630

			sh1					
319		16260	OPB-c1	1	11	BODY	,Midden,	630
319		16260	OPD-m1	1	6	BODY	,Midden,	630
319		16260	RP-m2	1	7	BODY	,Midden,	630
319		16260	DMSop	11	158	BODY	,Midden,	630
319		16260	LT	1	14	BODY	,Midden,	630
319		16262	CM	5	65.1	BODY	,Midden,Trodden Surface,	730
319		16262	CMB-m2	1	8	BODY	,Midden,Trodden Surface,	730
319		16262	DMS-m1	15	137	BODY	,Midden,Trodden Surface,	730
319		16262	DMB-m1	13	148	BODY	,Midden,Trodden Surface,	730
319		16262	DMBop-c1	8	99	BODY	,Midden,Trodden Surface,	730
319		16262	DMMop-m1	2	18	BODY	,Midden,Trodden Surface,	730
319		16262	DMSop-m1	4	58	BODY	,Midden,Trodden Surface,	730
319		16262	DMS-sh-op1	4	31	BODY	,Midden,Trodden Surface,	730
319		16262	DMS-sh	10	92	BODY	,Midden,Trodden Surface,	730
319		16262	OPB-c1	1	17	BODY	,Midden,Trodden Surface,	730
319		16262	OPD-m1	3	32	BODY	,Midden,Trodden Surface,	730
319		16262	CHA	1	2	BODY	,Midden,Trodden Surface,	730
319		16281	DMM-m1	1	31.7	BODY	,brick,	310
319		16507	CM	5	47	BODY	,midden,trodden surface,	730
319		16507	DMS-m1	1	17	BODY	,midden,trodden surface,	730
319		16507	DMB-c1	1	9	BODY	,midden,trodden surface,	730
319		16507	DMB-f1	7	61	BODY	,midden,trodden surface,	730
319		16507	DMCop	2	16	BODY	,midden,trodden surface,	730
319		16507	DMM-m1	4	54	BODY	,midden,trodden surface,	730
319		16507	DMSop-m1	1	6	BODY	,midden,trodden surface,	730
319		16507	DMS-sh1	1	5	BODY	,midden,trodden surface,	730
319		16507	K-c1	1	172	BODY	,midden,trodden surface,	730
319		16507	RP-m1	1	20	BODY	,midden,trodden surface,	730
319		16507	CHA	3	24	BODY	,midden,trodden surface,	730
319		16534	CM	11	116	BODY	,midden,	2100
319		16534	CMO-s	2	13	BODY	,midden,	2100
319		16534	CMC-s1	1	10	BODY	,midden,	2100

319		16534	DMS-f,m	41	365	BODY	,midden,	2100
319		16534	DMS-c1	5	63	BODY	,midden,	2100
319		16534	DMM-m2	1	5	BODY	,midden,	2100
319		16534	DMMop-m1	1	7	BODY	,midden,	2100
319		16534	DMS-sh1	35	261	BODY	,midden,	2100
319		16534	DM-sh-op1	11	110	BODY	,midden,	2100
319		16534	DMSop-c1	3	28	BODY	,midden,	2100
319		16534	DMSop-f,m,c	18	141	BODY	,midden,	2100
319		16534	K	5	41	BODY	,midden,	2100
319		16534	OPB-m1	1	16	BODY	,midden,	2100
319		16534	OPL-m1	3	17	BODY	,midden,	2100
319		16534	OPM	5	36	BODY	,midden,	2100
319		16534	W-f2	3	22	BODY	,midden,	2100
319		16534	LT	2		BODY	,midden,	2100
319		16568	CM	3	19.6	BODY	,Layer,Levelling,Midden,	300
319		16568	CMB-s1	1	11.6	BODY	,Layer,Levelling,Midden,	300
319		16568	DMS-m	11	89.5	BODY	,Layer,Levelling,Midden,	300
319		16568	DMS-sh1	2	12.7	BODY	,Layer,Levelling,Midden,	300
319		16568	DM-sh-op1	6	34.4	BODY	,Layer,Levelling,Midden,	300
319		16568	DMSop-m1	2	24.4	BODY	,Layer,Levelling,Midden,	300
319		16568	OPD-m1	2	30.7	BODY	,Layer,Levelling,Midden,	300
319		16568	LT	1	5.1	BODY	,Layer,Levelling,Midden,	300
319	1341	16578	DMB-m1	3	38	BODY	,Mortar,	305
319	1341	16578	DMM-f1	1	6	BODY	,Mortar,	305
319	1341	16578	DMS-m1	1	6	BODY	,Mortar,	305
319	1341	16578	DMSop-m1	1	36	BODY	,Mortar,	305
319	1341	16578	DMS-sh1	1	8	BODY	,Mortar,	305
319	1341	16578	K-m1	1	10	BODY	,Mortar,	305
319	1341	16578	LT	1	6	BODY	,Mortar,	305
319	1341	16559	CMB-f1	1	11.4	BODY	,Butress/Levelling,	1500
319	1341	16559	CM	6	99.7	BODY	,Butress/Levelling,	1500
319	1341	16559	DMB-m1	5	72.5	BODY	,Butress/Levelling,	1500
319	1341	16559	DMM-m1	1	23.5	BODY	,Butress/Levelling,	1500
319	1341	16559	DMS-c1	2	21.3	BODY	,Butress/Levelling,	1500
319	1341	16559	DMS-f,m	3	42.6	BODY	,Butress/Levelling,	1500
319	1341	16559	OPL-m2	1	14.8	BODY	,Butress/Levelling,	1500
319		16253	DMS-c2	1	26	B9	,midden,	570
319		16253	K-m1	1	13	BWUnl	,midden,	570
319		16253	K-m1	1	12	BW11	,midden,	570
319		16253	DMB-f1	1	5	H7	,midden,	570

319		16253	DMB-f1	1	14	K7a	,midden,	570
319		16253	DMS-f1	1	38	LgH2	,midden,	570
319		16253	DMS-m1	1	109	LgH7	,midden,	570
319		16253	CM-s1	1	14	MdBW11	,midden,	570
319		16253	CM-s2	1	6	SmBW1	,midden,	570
319		16253	CMB-f1	1	22	T3b	,midden,	570
319		16258	DMS-m1	1	15	UnI	,midden,	470
319		16258	CMO-s1	1	21	B3b	,midden,	470
319		16258	CM-c1	1	33	BW1	,midden,	470
319		16258	OPB-m1	1	64	LgBW11	,midden,	470
319		16258	CMB-m1	1	32	B12	,midden,	470
319		16258	CM-s2	1	27	SQ1	,midden,	470
319		16259	W-m2	1	25	BW11	trodden surface,	90
319		16259	DMB-f1	1	9	H2	trodden surface,	90
319		16260	DMS-c1	1	28	B1a-tc	,Midden,	630
319		16260	DMS-c1	1	14	B1-tc	,Midden,	630
319		16260	CM-s2	1	9	B1-tn	,Midden,	630
319		16260	CMB-m1	1	7	B8	,Midden,	630
319		16260	DMS-m1	1	55	B9	,Midden,	630
319		16260	CM	2	23	BWUnI	,Midden,	630
319		16260	CM-s1	1	44	BW11	,Midden,	630
319		16260	CM-s1	1	49	BW3	,Midden,	630
319		16260	CM-s2	1	23	BW4+B12	,Midden,	630
319		16260	DMS-f1	1	13	HUnI	,Midden,	630
319		16260	DMS-f,m	2	28	H7	,Midden,	230
319		16260	DMS-m1	1	21	LgH2	,Midden,	630
319		16260	DMS-f1	1	38	LgH7+T3b	,Midden,	630
319		16260	DMM-f1	1	21	MdH6a	,Midden,	630
319		16260	DMS-m1	1	17	MdH7	,Midden,	630
319		16260	CM-s1	1	37	T2a	,Midden,	630
319		16260	DMMop-m1	1	22	UnI	,Midden,	630
319		16260	DMM-m2	1	7	UnI	,Midden,	630
319		16260	DM-sh-op1	1	6	UnI	,Midden,	630
319		16260	DMS-sh2	1	7	UnI	,Midden,	630
319		16262	OPM-c1	1	14	B12	,Midden,Trodden Surface,	730
319		16262	DMB-m1	1	19	B1a-tc	,Midden,Trodden Surface,	730
319		16262	OPD-f1	1	8	B1a-tn	,Midden,Trodden Surface,	730
319		16262	CM-s1	1	26	B1-tn	,Midden,Trodden Surface,	730
319		16262	DMS-m1	1	16	B1-tn	,Midden,Trodden Surface,	730
319		16262	DMM-m1	1	12	B3a	,Midden,Trodden Surface,	730
319		16262	CMB-m1	1	8	BWUnI	,Midden,Trodden Surface,	730
319		16262	DMS-m1	1	14	BWUnI	,Midden,Trodden Surface,	730

319		16262	CMB-m2	1	22	BW11	,Midden,Trodden Surface,	730
319		16262	CM-s1	1	7	BW11	,Midden,Trodden Surface,	730
319		16262	CM-s1	1	9	BW3	,Midden,Trodden Surface,	730
319		16262	W-f1	1	6	BW8	,Midden,Trodden Surface,	730
319		16262	CM-s	2	58	BW8	,Midden,Trodden Surface,	730
319		16262	CM-f1	1	3	D5	,Midden,Trodden Surface,	730
319		16262	DM-sh-op1	1	7	H2	,Midden,Trodden Surface,	730
319		16262	DMS-sh1	1	10	H6	,Midden,Trodden Surface,	730
319		16262	DMS-m1	1	24	H7	,Midden,Trodden Surface,	730
319		16262	DMS-sh1	1	9	H7	,Midden,Trodden Surface,	730
319		16262	DMS-c	2	31	H7	,Midden,Trodden Surface,	730
319		16262	DMS-f1	1	11	H9	,Midden,Trodden Surface,	730
319		16262	DMS-c1	1	87	LgH7	,Midden,Trodden Surface,	730
319		16262	DMS-c1	1	35	LgT3b	,Midden,Trodden Surface,	730
319		16262	DMS-f,m	3	34	UnI	,Midden,Trodden Surface,	730
319		16262	DMS-sh1	1	9	UnI	,Midden,Trodden Surface,	730
319		16262	DMB-f,m	2	23	UnI	,Midden,Trodden Surface,	730
319		16507	CM-s1	1	248	B6	,midden,trodden surface,	730
319		16507	OPC-f1	1	27	BW2	,midden,trodden surface,	730
319		16507	DMS-m1	1	23	H13	,midden,trodden surface,	730
319		16507	DMS-c1	1	12	H7	,midden,trodden surface,	730
319		16507	DMS-f1	1	20	SmH2+T3b	,midden,trodden surface,	730
319		16507	DMS-m1	1	12	UnI	,midden,trodden surface,	730
319		16507	OPB-f1	1	6	UnI	,midden,trodden surface,	730
319		16507	DMS-sh1	1	7	UnI	,midden,trodden surface,	730
319		16534	CM-s2	1	17	B1a-tn	,midden,	2100
319		16534	DMS-f1	1	7	B1a-tn	,midden,	2100
319		16534	DMS-sh1	2	22	B1a-tn	,midden,	2100
319		16534	CM-s	2	22	B1-tn	,midden,	2100
319		16534	DMS-sh1	1	29	B3a	,midden,	2100

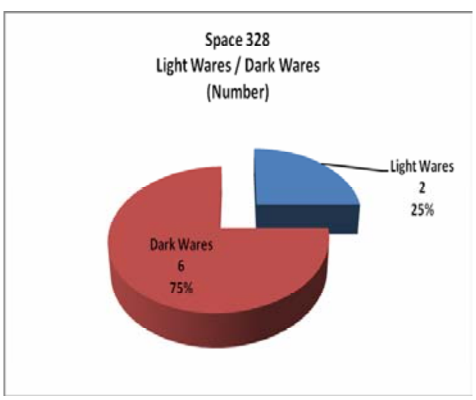
319		16534	CM	5	76	BWUnI	,midden,	2100
319		16534	CM-s1	1	25	BW1	,midden,	2100
319		16534	DMS-m1	1	6	BW11	,midden,	2100
319		16534	CM-c1	1	25	BW11	,midden,	2100
319		16534	OPD-f1	1	8	BW11	,midden,	2100
319		16534	CM-s2	1	24	BW3	,midden,	2100
319		16534	OPD-m1	1	10	BW3	,midden,	2100
319		16534	CM-f1	1	11	BW8	,midden,	2100
319		16534	OPM-f1	1	6	BW8	,midden,	2100
319		16534	DMS-m1	2	32	HUnI	,midden,	2100
319		16534	DMS-c1	1	19	HUnI	,midden,	2100
319		16534	DMS-f,m	2	19	H2	,midden,	2100
319		16534	DMM-m1	1	8	H2	,midden,	2100
319		16534	DMS-m1	2	26	H7	,midden,	2100
319		16534	DMS-m1	2	28	LgH2	,midden,	2100
319		16534	DMB-m1	1	31	LgH2	,midden,	2100
319		16534	DMSop-f1	1	107	LgH2+LgT3b	,midden,	2100
319		16534	DMS-f1	1	21	LgH7	,midden,	2100
319		16534	DMSop-m1	2	55,4	LgT3b	,midden,	2100
319		16534	DMS-f,m	2	22	MdH2	,midden,	2100
319		16534	OPD-m1	1	31	MdH2	,midden,	2100
319		16534	OPM-m1	1	18	MdH6a	,midden,	2100
319		16534	OPL-m1	1	8	SmBW8	,midden,	2100
319		16534	DMS-sh1	1	16	SmH2	,midden,	2100
319		16534	DMS-f1	1	6	SmH7	,midden,	2100
319		16534	DM-sh-op1	1	13	T3b	,midden,	2100
319		16534	DMS-sh1	1	5	UnI	,midden,	2100
319		16534	DMS-m1	1	12	UnI	,midden,	2100
319		16534	OPD-f1	1	13	UnI	,midden,	2100
319		16534	DM-sh-op1	1	12	UnI	,midden,	2100
319		16568	OPD-f1	2	29,1	B14	,Layer,Levelling,Midden,	300
319		16568	OPD-f1	1	9.2	BW11	,Layer,Levelling,Midden,	300
319		16568	W-f2	1	7.7	BW3	,Layer,Levelling,Midden,	300
319		16568	CMB-f1	1	9	BW4	,Layer,Levelling,Midden,	300
319		16568	CM-f2	1	5,2	BWUnI	,Layer,Levelling,Midden,	300
319		16568	DMS-m1	1	10.7	H2	,Layer,Levelling,Midden,	300
319		16568	DMSop-m1	1	35,6	H7	,Layer,Levelling,Midden,	300
319		16568	DMS-f1	1	8	SmH2	,Layer,Levelling,Midden,	300
319		16568	DMS-m1	1	8,8	SmH7	,Layer,Levelling,Midden,	300

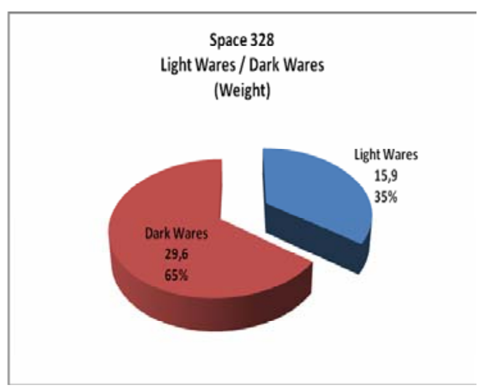
319		16568	DMS-m	2	24,1	Unl	,Layer,Levelling,Midden,	300
319	2645	16281	OPL-f2	1	14.6	BW8	,brick,	310
319	1341	16559	OPD-c1	1	23.8	Unl	,Butress/Levelling,	1500
319	1341	16559	DMC-c1	1	14.1	H2	,Butress/Levelling,	1500
319	1341	16559	DM-sh-op1	1	27.3	Unl+T2b+T4	,Butress/Levelling,	1500
319	1341	16578	DMS-m1	1	21	H7	,Mortar,	305
319	1341	16578	OPB-m1	1	14	BW3a	,Mortar,	

Building 75

Space 328:
The total number of sherds from this space is 8 from 5 units. The excavated units are mostly make-up and levelling dump in character. Whilst the small number of sherds is not appropriate for reliable statistics the majority is clearly Dark Ware (2/6). Of interest is the differentiation of results of last year's and this year's in the same space. Last year Sp 328 had dominancy of OP Ware (Orange Paste) that was not expected from B.75. The increase of the number of this ware group is mostly expected from Mellaart Level V-IV. However it was assumed that B.75 is earlier than Level V, and we checked our results again, but there was no mistake in our analysis. This year the small amount of pottery indicates that most of the sherds were collected from the space last year. We believe that the sherds found this year, were only the residual fragments and/or the sherds that came in to the building space with the soil used for make-up and some levelling purposes.

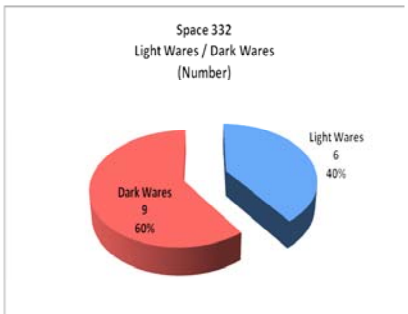
Space	Feature	Unit	Ware code	Total	Weight	Sherd	Interpretive category	Totalvolumedeposit
,328,	,2637,	17030	DMS-f1	1	6	BODY	,make-up,residual floor,	0
,328,		17055	DMSop-m1	1	7.4	BODY	,make-up,	0
,328,		17088	DMS-sh1	4	16.2	BODY	,levelling dump,	0
,328,		17301	CM-f1,3	1	5.7	BODY	,Fill of construction cut,	76
,328,		17055	CO-f1	1	10.2	Unl	,make-up,	0

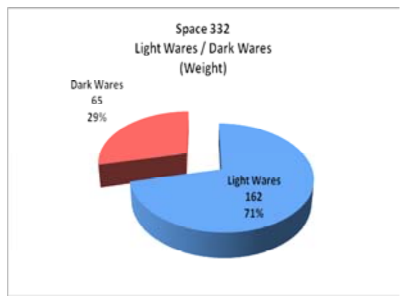


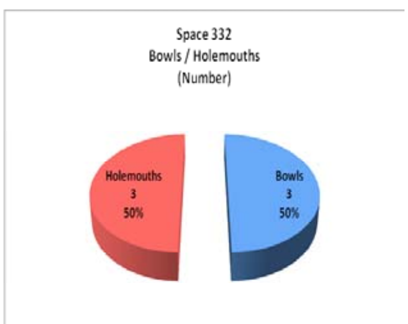


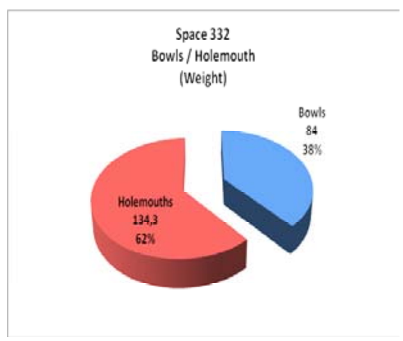
Space 332:
It is unclear whether this space was part of Building 75. That it is is perhaps suggested by its shared use of the south wall of Building 75 (from Excavation Database). The total number of sherds is 16 in this space and they were collected from 5 units. All of them make up/surface deposits in character. These were either introduced to the space as soil used in construction material or they are in secondary context and somehow imbedded in the surfaces of the building space. The dominant ware group is DMS but it is not a reliable result because of the small amount of the pottery.

Space	Feature	Unit	Ware code	Total	Weight	Sherd	Interpretive category	Totalvolumedeposit
332		17068	DMS-m1	1	8	BODY	,surface layer,	0
332		16572	RP-m1	1	7	BODY	,Dump/Makeup,Rough Surface,	0
332		17001	DMS-sh1	4	37	BODY		270
332		16523	DMS-m1	1	5	BODY	,Dump,Make-Up,Surface,	0
332		16572	DMS-sh1	1	28	B8	,Dump/Makeup,Rough Surface,	0
332		17001	DMS-f6	1	22.3	MdH2		270
332		17001	DMS-f6	1	13	H2		270
332		17001	OPD-m1	1	16	BW4		270
332		17068	CM-c1	3	99	LgH7	,surface layer,	0
332		17068	K-c1	1	40	BW3	,surface layer,	0









External Spaces

The pottery from external spaces has got a special significant in terms of understanding the change through the building sequence to the south of this area. Therefore these spaces and some of their units will be discussed here in detail.

Space 319

External space to the south of B.44 (from Excavation Database). This space is also the uppermost level of this external space sequence. It has nine units and five of them were targetted as priority units. These are (16253,16258, 16259, 16260 and 16262). The total numbers given with total volume of the units comprise only body and diagnostic sherds.

Priority unit (16253) is a midden deposit in phase with the Building 44 wall (from Excavation Database). There are a variety of ware groups in this unit and only DMS group appears as dominant ware. But of importance is the introduction of a new type of the Dark Ware group, DMB (Dark Mineral Brittle) due to its different firing technology. It seems its production fire was higher in temperature and/or the duration in the high temperature was longer than the other groups. That may indicate a pit firing rather than bonfire. The other ware group DMM (Dark Mineral Mica) is associated in the same "brittle" group but with more mica inclusion. We saw this "brittle" effect not only in Dark Ware but in Light Ware too and the ware group CMB (Cream Mineral Brittle) was introduced as a new ware. The number of diagnostic sherds are small in number and there is not a big difference in the number of bowls and jars.

Number of Sherds	Total Weight (gr)	Total Volume of Deposit
43	447	570

Several layers of laminated midden deposits were removed as a single unit (16258). This layer sealed construction/ demolition layer (16259) and respects the level 3 wall of building 44 (from excavation database). Variation in the sherds seems to decrease slightly and the appearance of brittle ware is more distinctive in this unit. Non of the dark ware sherds have diagnostic pieces but the light wares have some bowl types and one square bowl fragment.

Number of Sherds	Total Weight (gr)	Total Volume of Deposit (lt)
38	607	470

(16259) is a possibly trodden surface, extremely compact & relatively level at the southern end of the deposit (from excavation database). Out of only 6 sherds we see a variation in brittle groups in such as DMB, CMB, OPB (Orange Paste Brittle). There is also a diagnostic rim sherd of W (White Ware) that is mostly seen in the upper levels (Level III-II).

Number of Sherds	Total Weight (gr)	Total Volume of Deposit (lt)
6	69	90

(16260) is a midden with phytoliths and possibly cess like organics(?), the earliest midden deposit to respect the south face of B.44 (from excavation database).

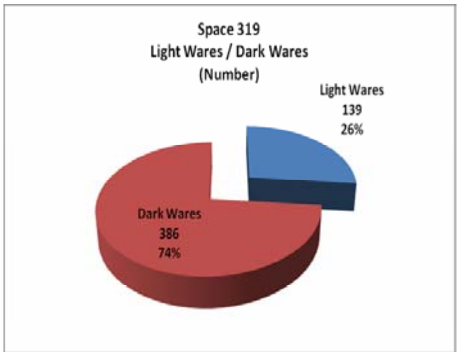
Number of Sherds	Total Weight (gr)	Total Volume of Deposit (lt)
69	1038	630

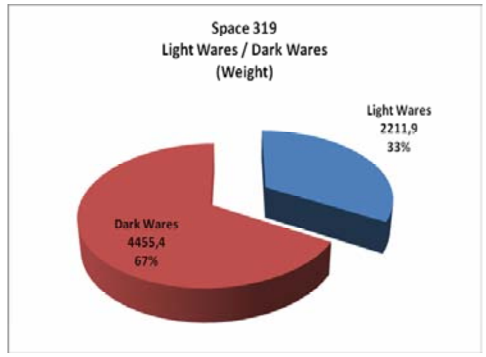
The pottery in this unit is relatively high in density. The dark ware groups seem to be dominant both in numbers (%72) and in weight (%69) comparing to the light ware groups. The brittle wares of different types of ware groups exist consistently: %42 in sherd number and %32 in weight. The number of diagnostic sherds (17) are small within the total amount but the sherd size varies from medium (approx. 55-60mm) to large (>55-60mm). 1 LT (Late) sherd may indicate an intrusion through animal borrows.

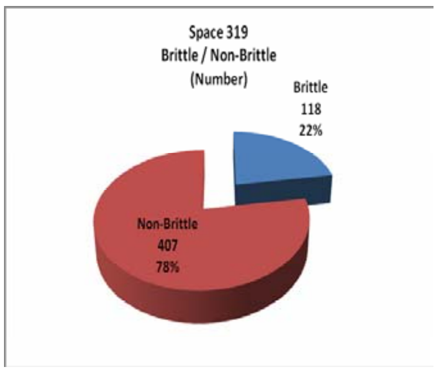
(16262) is represented by a layer of silty ash (midden) with frequent charcoal lumps capped with a thick yellowish brown layer of demolition/ construction trample/ trodden surface (from excavation database).

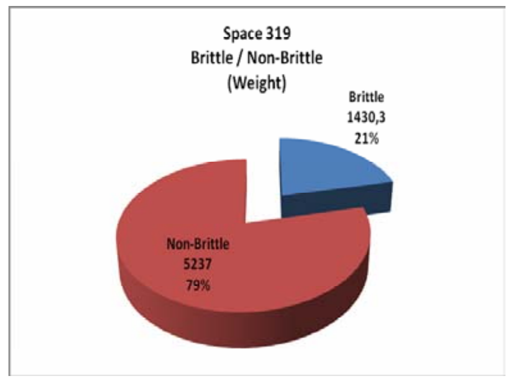
Number of Sherds	Total Weight (gr)	Total Volume of Deposit (lt)
95	1207	730

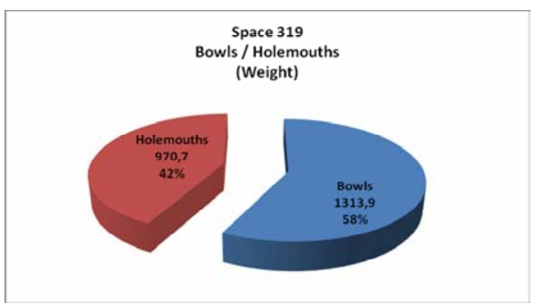
The increase of the dark ware numbers are clear both in numbers (% 78) and in weight (%77). But the number of brittle ware in both main groups stays more or less the same but slightly decreasing towards the lower end of the sequence; %34 in numbers and %32 in weight.

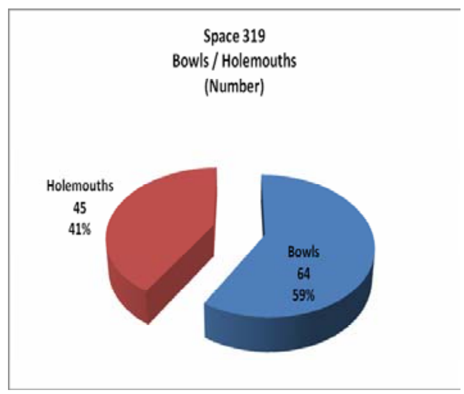












Space 339

This is the external space to the south of B.56. The space was filled with midden deposits frequently interspersed with fire spots and pits (from excavation database). There are five units that have pottery in it. The pottery density is high in this space.

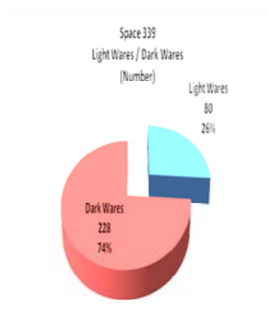
Number of Sherds	Total Weight (gr)	Total Volume of Deposit (lt)
299	3665.5	553

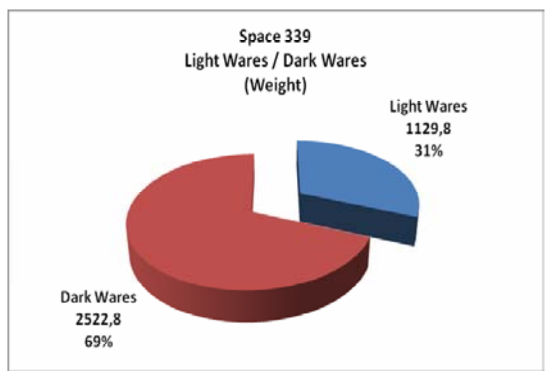
The ware and type group relationship is quite interesting in this space. The dark ware percentage is higher than the light ware, although it is expected that the holemouth jar forms should also be high in proportion, the bowl forms are dominant. This situation clearly indicates that while they were using the dark ware technology a more open bowl shape was favoured. The other result from pottery analysis is about the new ware group “brittle ware”. It is clearly decreasing in this space units.

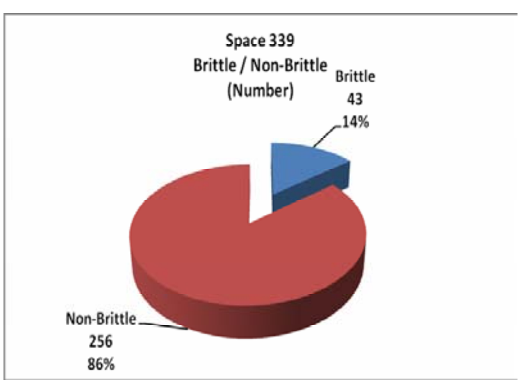
Space	Feature	Unit	Ware code	Total	Weight	Sherd	Interpretive category	Totalvolumedeposit
339		16590	CM	9	111	BODY	,midden,	6400
339		16590	CMB-s1	5	42	BODY	,midden,	1600
339		16590	CMM-m1	1	5	BODY	,midden,	1600
339		16590	CMO-m1	1	23	BODY	,midden,	1600
339		16590	CM/OPD-m1	1	7	BODY	,midden,	1600
339		16590	DMS-m1	39	381	BODY	,midden,	1600
339		16590	DMS-c1	5	52	BODY	,midden,	1600
339		16590	DMSop-m1	14	128	BODY	,midden,	1600
339		16590	DMS-sh1	13	85	BODY	,midden,	1600
339		16590	DMM-m1	4	39	BODY	,midden,	1600
339		16590	DM-sh-op1	4	27	BODY	,midden,	1600
339		16590	OPD	2	43	BODY	,midden,	3200
339		16590	OPC-m1	2	11	BODY	,midden,	1600
339		16590	OPM-m1	2	21	BODY	,midden,	1600
339		16590	LT	2	3	BODY	,midden,	1600
339		17017	CM-f2	1	4	BODY	,midden,	1600
339		17017	CMB-s	3	21	BODY	,midden,	1600
339		17017	CMB-c2	1	10	BODY	,midden,	1600
339		17017	OPB-f1	3	15	BODY	,midden,	1600
339		17017	OPD-f1	3	25	BODY	,midden,	1600
339		17017	OPL-f1	1	6	BODY	,midden,	1600
339		17017	RP-c1	2	20	BODY	,midden,	1600
339		17017	DMS-f,m	25	281	BODY	,midden,	1600
339		17017	DMS-c2	4	42	BODY	,midden,	1600
339		17017	DMSop-m1	3	24	BODY	,midden,	1600
339		17017	DMS-sh1	12	108	BODY	,midden,	1600
339		17017	DM-sh-op1	4	24	BODY	,midden,	1600
339		17017	DMB-m1	6	78	BODY	,midden,	1600
339		17017	DMB-c2	1	13	BODY	,midden,	1600
339		17017	DMBop-f1	2	10	BODY	,midden,	1600
339		17017	DMCop-m1	1	12	BODY	,midden,	1600
339		17017	DMM-m1	5	64	BODY	,midden,	1600
339		17039	DMSop-f1	1	7	BODY	,Midden with trodden upper surface,	510
339		17047	CM-s1	1	53	BODY	,Midden deposit,	235
339		17047	CMB-m2	1	10.9	BODY	,Midden deposit,	235
339		17047	CM/K-s2	1	29	BODY	,Midden deposit,	235
339		17047	OPD	5	31.2	BODY	,Midden deposit,	235
339		17047	OPB	2	19.5	BODY	,Midden deposit,	235
339		17047	W-m1	2	33.5	BODY	,Midden deposit,	235
339		17047	K-m1	1	13.3	BODY	,Midden deposit,	235
339		17047	DMS-f,m	13	181.8	BODY	,Midden deposit,	235
339		17047	DMSop-m1	1	16.4	BODY	,Midden deposit,	235

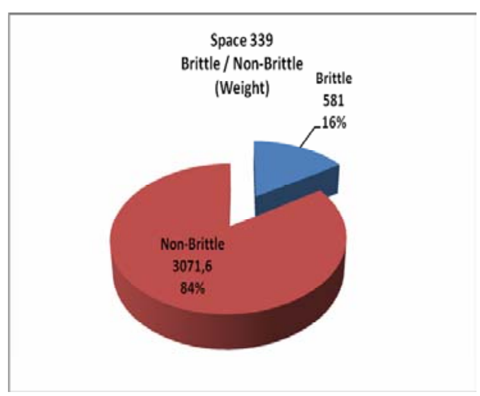
339		17047	DMS-sh1	5	43	BODY	,Midden deposit,	235
339		17047	DM-sh-op1	1	10.5	BODY	,Midden deposit,	235
339		17047	DMB-m1	1	8.1	BODY	,Midden deposit,	235
339		17047	LT	1	8.4	BODY	,Midden deposit,	235
339		17058	CM	4	28.4	BODY	,Midden,	530
339		17058	OPD	3	27	BODY	,Midden,	530
339		17058	W/CM-s	2	47	BODY	,Midden,	530
339		17058	DMS-f,m	12	120	BODY	,Midden,	530
339		17058	DMSop	4	76.9	BODY	,Midden,	530
339		17058	DMS-sh1	6	29.2	BODY	,Midden,	530
339		17058	CHA	1	1.5	BODY	,Midden,	530
339		16590	DMSop-m1	1	10	B1a-tn	,midden,	1600
339		16590	DMS-f1	1	7	B1-tn	,midden,	1600
339		16590	OPB-m1	1	19	BW1	,midden,	1600
339		16590	CM-s2	1	30	BW11	,midden,	1600
339		16590	CMB-m1	1	11	BW11	,midden,	1600
339		16590	CMB-s1	1	14	BW11+UnI	,midden,	1600
339		16590	CM	2	35	BW3	,midden,	1600
339		16590	OPB	2	33	BWUnI	,midden,	1600
339		16590	DM-sh-op1	1	13	BWUnI	,midden,	1600
339		16590	CM	3	49	BWUnI	,midden,	1600
339		16590	DMS-f1	1	16	H2	,midden,	1600
339		16590	DMS-m	2	33	H7	,midden,	1600
339		16590	DMS-m1	1	15	HUnI	,midden,	1600
339		16590	DMS-f1	1	20	LgH7	,midden,	1600
339		16590	CM-s1	1	2	MB1a-tn	,midden,	1600
339		16590	DMS-sh1	1	16	MdH2	,midden,	1600
339		16590	DMS-sh1	2	16	SmH2	,midden,	1600
339		16590	DMS-sh1	1	16	T3b	,midden,	1600
339		16590	OPD-f1		9	UnI	,midden,	1600
339		16590	DMS-f1	1	10	UnI	,midden,	1600
339		16590	DM-sh-op1	1	8	UnI	,midden,	1600
339		16590	DMS-c1	1	28	UnI	,midden,	1600
339		16590	CM-c1	1	22	UnI	,midden,	1600
339		17017	CM	2	29	B1a-tn	,midden,	1600
339		17017	DMS-m1	1	26	B1a-tn	,midden,	1600
339		17017	DMBop-m1	1	60	B1a-tn	,midden,	1600
339		17017	CM-f2	1	8	B1-tn	,midden,	1600
339		17017	DMS-f1	1	11	B1-tn	,midden,	1600
339		17017	DM-sh-op1	1	16	B23	,midden,	1600
339		17017	DMS-f1	1	9	H2a	,midden,	1600
339		17017	DMM-m1	1	34	H7	,midden,	1600
339		17017	DMB-m2	1	14	HUnI	,midden,	1600
339		17017	DMS-sh1	1	9	HUnI	,midden,	1600
339		17017	CM-c1	1	16	MscB5	,midden,	1600

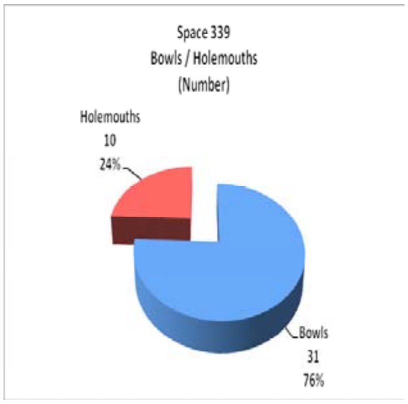
339		17017	CM-s2	1	9	SmBW8-ov	,midden,	1600
339		17017	CMB-f1	1	4	SmT12b	,midden,	1600
339		17017	DMSop-m1	1	19	T1b	,midden,	1600
339		17017	DMS-m1	1	30	T3b	,midden,	1600
339		17017	DMS-m1	1	7	UnI	,midden,	1600
339		17039	DMS-m1	1	23	T3c	,Midden with trodden upper surface,	510
339		17047	DMS-m1	1	26.3	B1b	,Midden deposit,	235
339		17047	CM-s1,4	1	18.4	BW1	,Midden deposit,	235
339		17047	DMCop-m1	1	27.1	BW8	,Midden deposit,	235
339		17047	OPD-m1	1	16.5	HUnI	,Midden deposit,	235
339		17047	DMS-m1	1	7.9	HUnI	,Midden deposit,	235
339		17047	CM-s2	1	12.7	MnBW1	,Midden deposit,	235
339		17047	CM-f1	1	4.4	MnBW8	,Midden deposit,	235
339		17047	DMBop-m1	1	38.6	T3b	,Midden deposit,	235
339		17047	DMS-m	2	16.5	UnI	,Midden deposit,	235
339		17047	DMSop-c1	1	11	UnI	,Midden deposit,	235
339		17058	DMS-sh2	1	11.5	H7	,Midden,	530
339		17058	W/CM-s1	1	104	B1a-tc	,Midden,	530
339		17058	DMS-m1	1	20	UnI	,Midden,	530
339		17058	CM-f6	1	9	UnI	,Midden,	530
339		17058	DMS-c1	1	37	UnI	,Midden,	530
339		17058	CM-c1	1	18	B5	,Midden,	530

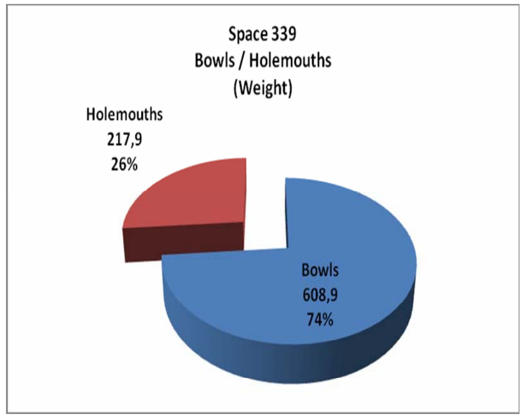






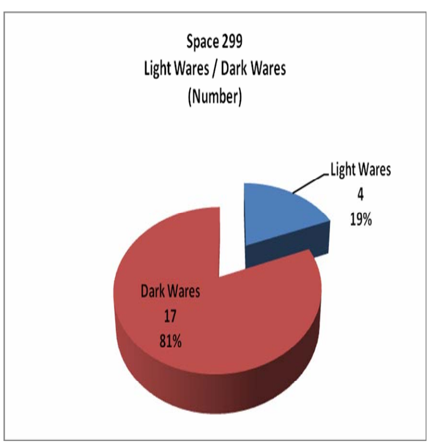


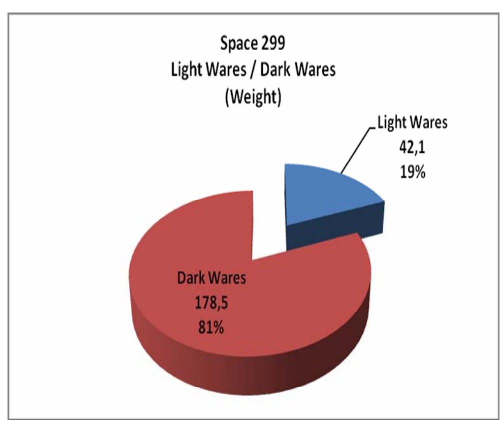


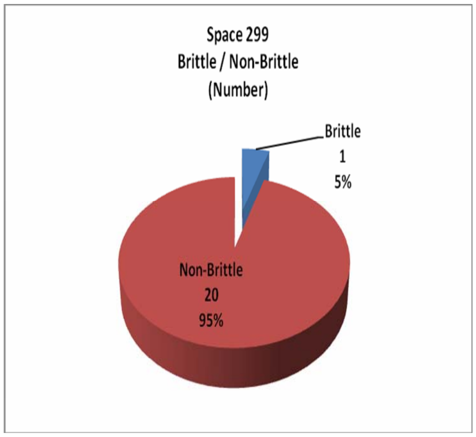


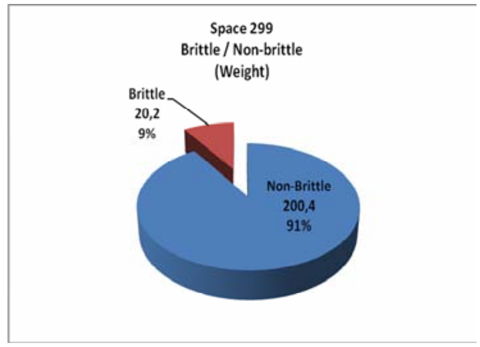
Space 299
This space is prior to the construction of B.56, or may be associated with the building to the south B.65 (interpreted from Excavation Database). There are three units which contain 21 sherds from 220.6gr) which is quite small. There are only 4 diagnostic sherds. The dominance of dark ware is clear. But of importance is the decrease in "brittle ware" in this space.

Space	Feature	Unit	Ware code	Total	Weight	Sherd	Interpretive category	Totalvolumedeposit
299		17078	CM-f1	1	5	BODY	,demolition horizon,	50
299		17078	DMS-f1	3	26.8	BODY	,demolition horizon,	50
299		17087	CM-f2	1	5	BODY	,trodden surface,	180
299		17087	DMgi-c1	1	10	BODY	,trodden surface,	180
299		17087	DMS-m1	1	10	BODY	,trodden surface,	180
299		17087	DMS-sh1	3	16	BODY	,trodden surface,	180
299		17087	OPD-f1	1	7	BODY	,trodden surface,	180
299		17306	DMSop-c2	1	11.8	BODY	,Midden,	250
299		17306	DMS-f,m	5	34.7	BODY	,Midden,	500
299		17306	DMB-c2	1	20.2	Unl	,Midden,	250
299		17306	OPD-c1,3	1	25.1	Unl	,Midden,	250
299		17306	DMS-m1	1	24.9	HUnl	,Midden,	250
299		17306	DMS-sh1	1	24.1	B16	,Midden,	250









Conclusion:
These spaces to the south of the building sequence give important clues about the pottery changing through time. The quick change shows the acceleration, from Sp 299 towards Sp 319. The identification of a new ware group provided a very useful guideline. In order to address more accurate statements we need the TP Area analysis and statistical results that will be available in the near future.

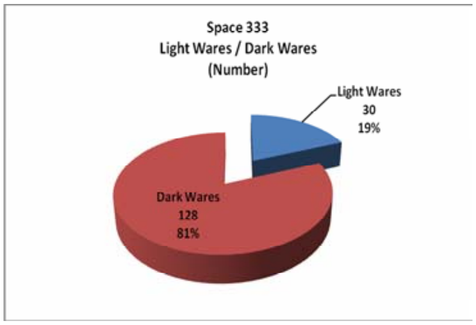
Space 333:
Lying above the upper oven was a series of levelling dumps/surfaces in this area of Sp 333 (from excavation database). There are eighteen units that contain pottery. The dark ware percentage is higher than the light ware and the holemouth jar form percentage is coherently higher than the bowl forms. But the jars are medium and small in size in general. Although the percentage of "brittle ware" is small it is still present as when compared to Sp 299 to the south.

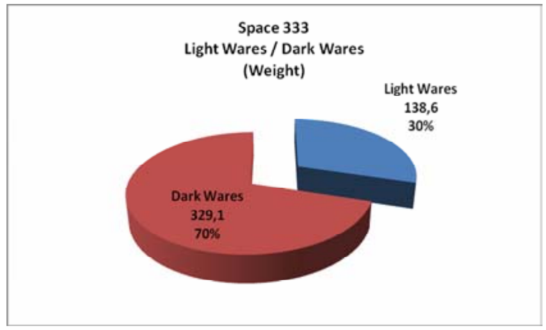
Unit (16247) and (16248) has Chalcolithic sherds but probably intrusive from upper levels. Although the whole space has a relatively large amount of pottery, unit (17339) shows a specific concentration. In this unit the DMS-m1,4; the body pieces consist of 10 conjoining sherds with old breaks and a yellowish residue adhering to the broken sections. This indicates that the unit, possibly a primary refuse in the area / pit as opposed to fill moved from somewhere else.

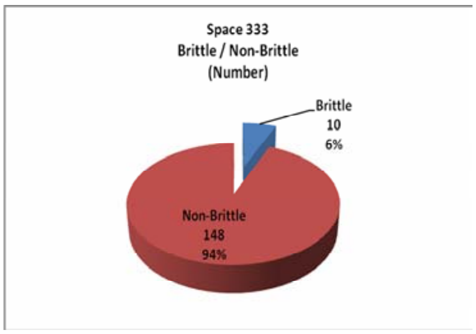
Space	Feature	Unit	Ware code	Total	Weight	Sherd	Interpretive category	Totalvolumedeposit
333		16246	DMS-m1	1	9	BODY	,dumped layer,	0
333		16247	CM	2	30	BODY	,dumped layer,	1950
333		16247	CMM-c1	1	11	BODY	,dumped layer,	1950
333		16247	DM-sh-op1	2	38	BODY	,dumped layer,	1950
333		16247	DMS-m1	8	66	BODY	,dumped layer,	1950
333		16247	DMSop-m1	3	33	BODY	,dumped layer,	1950
333		16247	DMS-sh1	3	17	BODY	,dumped layer,	1950
333		16247	OPD	2	9	BODY	,dumped layer,	1950
333		16247	CHA	1	5	BODY	,dumped layer,	1950
333		16248	CMB-m1	1	14	BODY	,dumped deposit/layer,	800
333		16248	DMS-f,m	3	50.2	BODY	,dumped deposit/layer,	800
333		16248	DMSop-m1	1	14	BODY	,dumped deposit/layer,	800

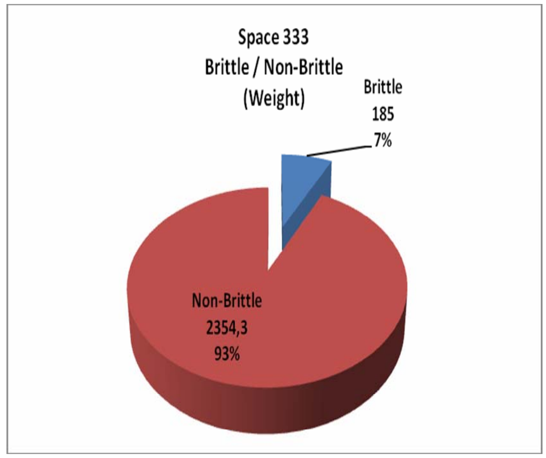
333		16248	DMS-sh1	3	18.8	BODY	,dumped deposit/layer,	800
333		16248	CHA	1	18	BODY	,dumped deposit/layer,	800
333		16249	OPL-m1	1	11	BODY	,dumped deposit,	0
333		16249	RP-c1	1	16	BODY	,dumped deposit,	0
333		16249	DMS-f,m	4	45	BODY	,dumped deposit,	0
333		16249	DMSop-m1	1	13	BODY	,dumped deposit,	0
333		16249	DMS-sh1	5	30	BODY	,dumped deposit,	0
333		16261	DMB-c1	4	89	BODY	,midden dump,	85
333		16261	DMBop-c1	1	53	BODY	,midden dump,	85
333		16267	DMS-c1	1	7	BODY	,levelling dump,	0
333		16267	DMSop-m1,4	1	7	BODY	,levelling dump,	0
333		16272	DMS-f1	1	8	BODY	,surface/ dump,	300
333		16272	DMSop-m1	1	24	BODY	,surface/ dump,	300
333		16272	RP-m1	3	21	BODY	,surface/ dump,	300
333		16289	DMC-c2	1	9.1	BODY	,ash dump,	0
333		16543	DMS-f1	1	5	BODY	,ash spread,	25
333		16549	DMS-f6	1	6	BODY	,surface/dump,	300
333		16549	DMSop-m1	1	8	BODY	,surface/dump,	300
333		16549	DMS-sh1	4	29	BODY	,surface/dump,	300
333		16570	DMS-m1	2	29	BODY	,surface/dump,	0
333		16579	DMM-f1	1	6	BODY	,foundation cut fill,	95
333		17036	CO-c2	1	14	BODY	,Levelling dump external,	1060
333		17036	DMS-f,m	2	13	BODY	,Levelling dump external,	1060
333		17036	DMS-c1	4	66	BODY	,Levelling dump external,	1060
333		17041	DMCop-m6	1	7	BODY	,Ash spread,	35
333		17041	DMSop-m1	1	9	BODY	,Ash spread,	35
333		17067	DMS-m1	1	28.5	BODY	,Levelling dump/S,	1130
333		17335	DMS-c1	1	71	BODY	,dumping,	1100
333		17335	DMS-f1	3	17	BODY	,dumping,	1100
333		17335	DMSop-m1	3	19	BODY	,dumping,	1100
333		17335	K-f1	1	16	BODY	,dumping,	1100
333		17335	OPD-m1,3	1	9	BODY	,dumping,	1100
333		17339	CM	2	23	BODY	,fill,	1100
333		17339	DMS-f,m	25	446	BODY	,fill,	1100
333		17339	DMSop-m1	2	19	BODY	,fill,	1100
333		17339	DMS-sh1	3	22	BODY	,fill,	1100
333		17339	DM-sh-op1	1	6	BODY	,fill,	1100

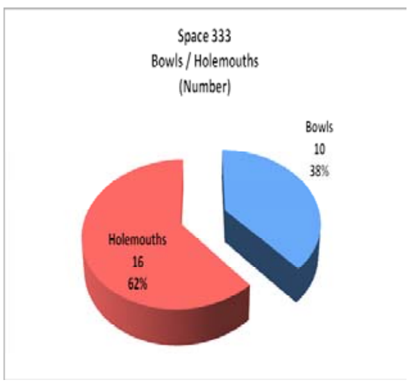
333		17339	DMM-m1	1	16	BODY	,fill,	1100
333		17339	OPD	4	29	BODY	,fill,	1100
333		16247	CM-s1	1	10	BWUnl	,dumped layer,	1950
333		16247	DMS-f1	1	12	SmH2	,dumped layer,	1950
333		16248	DMSop-m1	1	30	T1b	,dumped deposit/layer,	800
333		16248	DMS-f1	1	11	SmH2	,dumped deposit/layer,	800
333		16248	DM-sh-op1	1	83	MdH7+T1b	,dumped deposit/layer,	800
333		16248	DMS-m1	1	19	HUnl	,dumped deposit/layer,	800
333		16248	DMS-f1	1	7	SmH2	,dumped deposit/layer,	800
333		16248	CMB-s1	1	7	BWUnl	,dumped deposit/layer,	800
333		16248	CM/K-c2	1	19.6	B1-tc	,dumped deposit/layer,	800
333		16249	DMS-m1	1	13	MdH2	,dumped deposit,	0
333		16249	OPD-m1	1	22	Unl	,dumped deposit,	0
333		16261	DMSop-m1	1	13	HUnl	,midden dump,	85
333		16261	DMS-m1	1	12	H7	,midden dump,	85
333		16261	RP-c1	2	162	B12	,midden dump,	85
333		16267	OPD-m1	1	15	Unl	,levelling dump,	0
333		16272	DMSop-m1	1	20	B1-tn	,surface/ dump,	300
333		16272	DMSop-m1	1	30	H2+Unl	,surface/ dump,	300
333		16272	DMS-m1	1	15	B1-tn	,surface/ dump,	300
333		16549	OPL-m1	1	8	Unl	,surface/dump,	300
333		17036	DMS-m1	1	6	SmH2	,Levelling dump external,	1060
333		17036	DMS-m1	1	11	SmH7	,Levelling dump external,	1060
333		17045	DMS-sh1	1	97	LgH7	,Fill of pit,	35
333		17067	DMS-f1	1	12	HUnl	,Levelling dump/S,	1130
333		17067	OPL-f1,3	1	11.1	Unl	,Levelling dump/S,	1130
333		17335	DMS-f1	1	13	B1-tn	,dumping,	1100
333		17335	CM-f2	1	10	BWUnl	,dumping,	1100
333		17335	DMS-m1	1	8	H7	,dumping,	1100
333		17335	DMS-m1	1	26	Unl	,dumping,	1100
333		17339	DMS-m1	2	19	Unl	,fill,	1100
333		17339	DMSop-m1	1	12	BW3	,fill,	1100
333		17339	DMS-m1	1	23	H7	,fill,	1100
333		17339	DM-sh-op1	1	22	LgH7	,fill,	1100
333		17339	DMS-m1	1	19	T2b	,fill,	1100

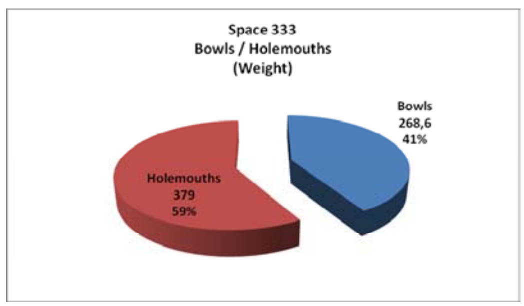










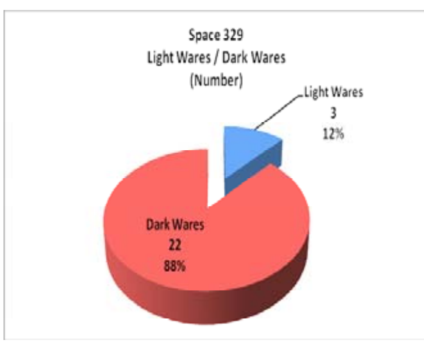


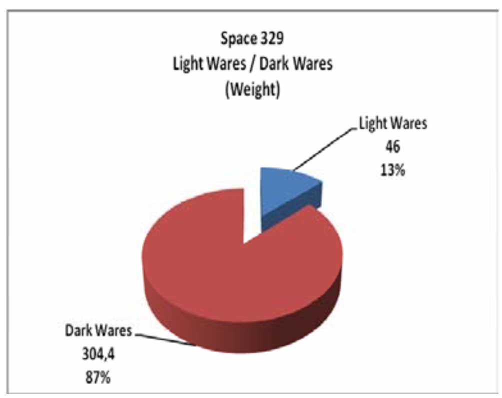
Space 329:
The continued excavation of the area to the east of Building 75 suggested this may have been an 'outside' or open area lying without buildings possibly even a yard area. This was indicated in last years' excavation by the presence of numerous fire spots and small fire pits. Continued excavation of this area this year revealed more fire spots/pits (from excavators report). Total number of sherds is 25 and only seven of them registered as diagnostics from nine units and these are not identical except one basket handle and a holemouth rim piece. Dark and non-brittle ware is dominant. But brittle ware exists.

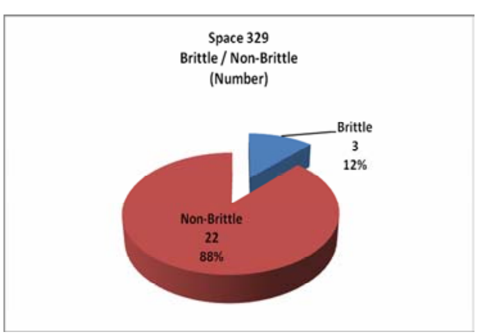
These results probably indicate that Sp 333 and Sp 329 and maybe Sp 299 represent the old / long term pot making traditions are still dominant but new technologies are about to start.

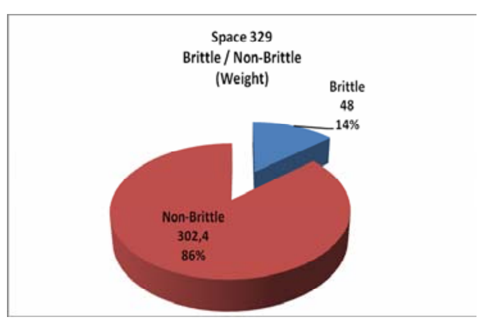
Space	Feature	Unit	Ware code	Total	Weight	Sherd	Interpretive category	Totalvolumedeposit
329		16250	DMS-m1	1	18	BODY	,burnt fill,	0
329		16558	DMS-m1	1	8	BODY	,Surface,	200
329		16558	DMS-	2	14	BODY	,Surface,	200

			sh1					
329		17048	DMS-c1	1	30	BODY	,external surface dump,	1125
329		17048	DMSop-m1	3	34	BODY	,external surface dump,	1125
329		17048	DMS-sh1	1	10	BODY	,external surface dump,	1125
329		17070	DMS-m1	3	38.4	BODY	,animal bone cluster,	45
329		17077	DMS-c1	1	13	BODY		0
329		17077	DMS-m1	3	20	BODY		0
329		17077	DMSop-m1	1	8	BODY		0
329		17082	DMS-m6	1	24	BODY	,black burnt material within a fire spot,	30
329		17302	DMMop-m1	1	5	BODY	,external area fill,	1340
329		17302	DMS-f1	1	6	BODY	,external area fill,	1340
329		15779	CO-f6	1	21	UnI	,mortar,	15
329		17048	CMB-c1	1	15	T4	,external surface dump,	1125
329		17048	DMM-m1	1	28	T4	,external surface dump,	1125
329		17048	DMSop-m1	1	29	UnI	,external surface dump,	1125
329		17048	RP-m1,3	1	10	UnI	,external surface dump,	1125
329		17048	DMS-m1	1	14	HUnI	,external surface dump,	1125
329		17098	DMS-f1	1	5	UnI	,external space fill,	410









IST Area
IST Area is excavated mainly within Building 63 that has five spaces Sp.283, Sp.284, Sp285, Sp289, Sp330. But also Sp 253 outside of the building.

Building 63
Total number of neolithic pot sherds is 28 from all spaces within the building from twelve units.

Space 283: Space 283 is the heavily burnt space. It has two phases. Both phases end up burnt. There are a series of bins on the west part located in the SW corner of Building 63, probably the working area of the building and connected to the N room, Sp289 where a treshhold lies between the two spaces (from the excavation database).

Space 283 is not rich in in situ pot sherds but seem to be present through the fill introduced into the space. Even the two sherds found in bin/basket/pouch (13919) are small fragments and belong to different pots.

Space	Feature	Unit	Ware code	Total	Weight	Sherd	Interpretive category	Totalvolumedeposit
283	2330	13919	CM	2	15,9	BODY	,bin?/basket?/pauch?,	0
283	2330	13919	OPL-m2	1	11.5	BODY	,bin?/basket?/pauch?,	0
283		13994	OPL-f1	1	7	BODY	,fill,	0
283		13995	OPM-m1	1	16	BODY	,fill,	0

Space 284: Is probably the living space, with platforms and a compact mud plastered floor.

This living space has the highest number of pot sherds (11) of the whole spaces dug in the IST Area. This is a rare situation as we do not expect more pot sherds in the buildings and even in the main room. The only LT sherd came from (13961) is a very small piece and must be introduced through animal burrows. The most important find are two insitu pots from this space. One of them was found in a bin fill (13925), F.2313, at the west end of the room. The pot was not complete but almost half (gives a complete profile from rim to base and a lug). The position of this half-pot made us think that it is deliberately placed there. Under the pot, on the soil there was a black residue. At first it looked like fire soot but it may be a residue of liquid leaked from the cracks of the sidelong placed pot (Figure 140). The fill and some broken off plaster fragments under the pot indicates that the bin was not in-use at the time when the half pot placed here.

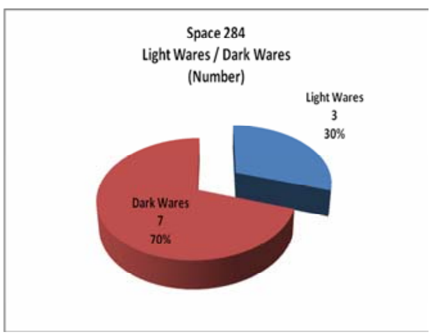

Figure 140: Pot 13925.S1 in bin fill F.2313

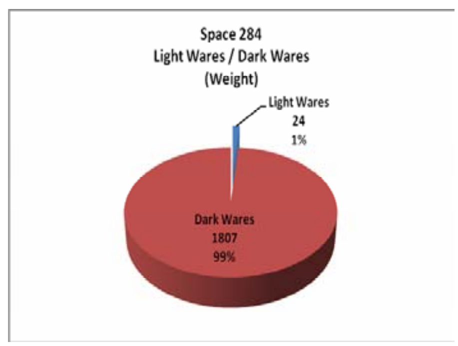
The second in situ find is a complete pot placed under the edge of the platform F.1993 (Figure 141). The pot was found in 2006 when the soil inside (12498) was excavated. This year we lifted the pot from its buried place. The dark ware holemouth jar was deliberately placed slightly under the edge of the platform. It was slightly distorted on one side either during occupation or later by

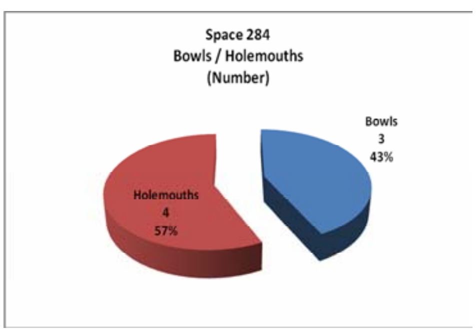

Figure 141: Pot 13970.x1,set into floors at corner of platform F.1993

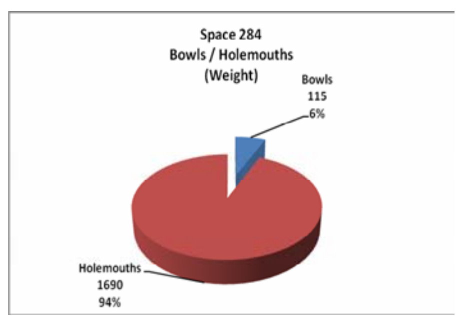
burial.

Space	Feature	Unit	Ware code	Total	Weight	Sherd	Interpretive category	Totalvolumedeposit
284	1994	13924	DMS-c2	1	11	BODY	,soil on platform,	0
284		13961	LT	1	1.6	BODY	,fill (above floor of 284),	0
284	1997	13932	OPD-m1	1	8	BODY	,cluster,	30
284	1997	13932	OPL-m1	1	7	BODY	,cluster,	30
284	1994	13924	DMS-m1	1	23	HUnl+Unl	,soil on platform,	0
284	1994	13924	DMS-m1	1	17	H6	,soil on platform,	0
284	2313	13925	DMCop-c1	1	545	SmH7+T3b+B25	,bin fill,	0
284	2313	13925	DMS-f1	1	79	B1a-tn	,bin fill,	0
284	1997	13932	OPD-m1	1	9	BW11	,cluster,	30
284	1997	13932	DMS-sh1	1	27	BW11-ov+SmT3b	,cluster,	30
284		13970	DMSop-m1	1	1105	H2+T3b+B3a	,pot,	0









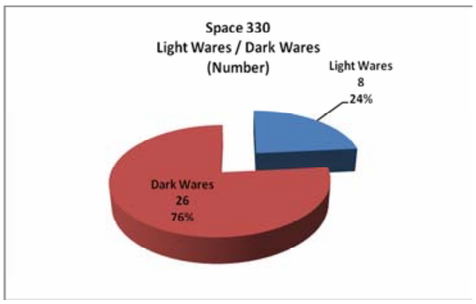
Space 285: This space number reprsents the kerb in this building and yields only two small sherds. They belong to the dark ware group and not very indicative.

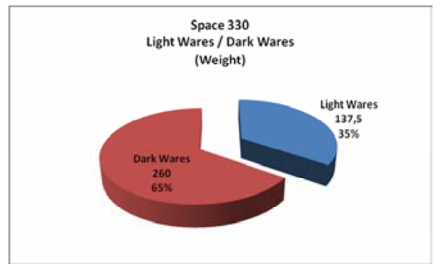
Space	Feature	Unit	Ware code	Total	Weight	Sherd	Interpretive category	Totalvolumedeposit
285	1992	13981	DMS-m1	1	11	BODY	,kerb,	0
285	1992	13981	DMS-m1	1	14	T3b	,kerb,	0

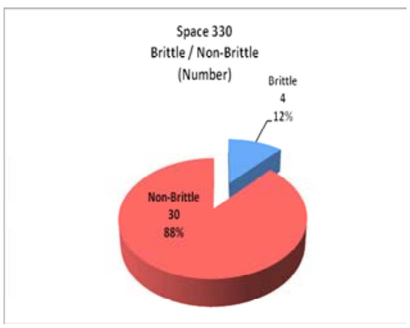
Space 289: This is the NW portion of Building 63. It is connected to Sp. 283 by a threshold (from the excavation database). This space is also not rich in pot finds and they do not have informative characteristics.

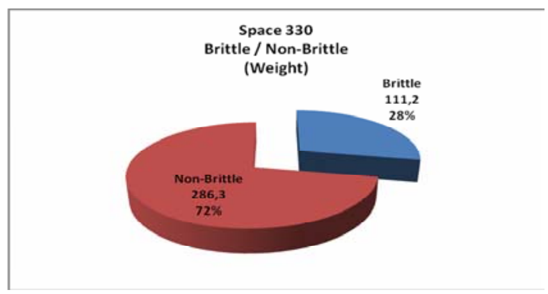
Space	Feature	Unit	Ware code	Total	Weight	Sherd	Interpretive category	Totalvolumedeposit
289		13927	CM-f1	1	10	BODY	,Fill (under floor),	0
289		13927	DMS-c1	1	8	BODY	,Fill (under floor),	0
289		13927	DMS-sh	2	10	BODY	,Fill (under floor),	0

Space 330: Sp. 330 is defined by its E wall and a possible platform(?) against the unexcavated W wall. The 7 sherds found in units of Sp 330 are very small, some with traces of burning. The mixed nature suggests secondary deposition through post occupation infilling.









Spaces 253 and 338 are also uninformative due to the size of the pot sherds.

Space	Feature	Unit	Ware code	Total	Weight	Sherd	Interpretive category	Totalvolumedeposit
330		13920	CM-f2	1	5.9	BODY	,burnt area,	0
330		13920	DMSop-m1	1	12.2	BODY	,burnt area,	0
330		13920	DMS-sh1	3	33.4	BODY	,burnt area,	0
330		13920	OPD-m1	2	18.5	BODY	,burnt area,	0
330		13921	DMS-f1	1	8.4	BODY	,Consantration of obsidian,	0
330		13921	DMSop-m1	2	14.6	BODY	,Consantration of obsidian,	0
330		13922	DM-sh-op1	1	4.6	BODY	,consantration of animal bones,	0
	2314	13929	CM-f1	1	12.6	BODY	,burnt area,	0
	2314	13929	DMS-m1	3	23.1	BODY	,burnt area,	0
330		13953	DMMop-m2	1	22.2	BODY	,fill (below the floor),	60
330		13953	DMS-sh1	2	15.6	BODY	,fill (below the floor),	60
330		13954	CMB-m1	1	40	BODY	,fill,	0
330		13954	CMM/CMB-m2	2	49	BODY	,fill,	0

330		13954	DMOop-m1	1	15	BODY	,fill,	0
330		13954	DMSop-m1	1	9	BODY	,fill,	0
330		13957	DMS-m1	1	11	BODY	,fill (under the F. 1956),	0
330		13957	DMSop-m1	1	14	BODY	,fill (under the F. 1956),	0
330		13960	CM-f1	1	11.5	BODY	,section,	0
330		13960	LT	1	3	BODY	,section,	0
330		13953	DMS-m1	1	7.1	UnI	,fill (below the floor),	60
330		13957	DMS-m1	1	26	LgH7	,fill (under the F. 1956),	0
330		13960	DMS-sh1	1	7.9	UnI	,section,	0
330	2314	13929	DMS-m1	1	7.2	UnI	,burnt area,	0
330	2314	13929	DMS-f1	1	13.2	HUnI	,burnt area,	0

Conclusion:
Results from the work but done in the IST Area, specifically from Sp 284, give us an important opportunity to make comparisons between the South and IST areas. The recurrent occurrence of pot emplacement in the B.44, B.56, B.65 and B.75 sequence seemed to be limited in this location. But these new finds of deliberately placed pots in B.63 may allow us to extend the area of the people who share similar behaviour.

Figurine Archive Report 2008 - Carolyn Nakamura and Lynn Meskell,

Stanford University

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

Figure 142: A flattened type of figurine plaque

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 143: Miniature figurine from TP Area 15839.X10

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.

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 omament that is more rounded and/or rimmed, see Fig. x. 'Adomment' 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							
	Breasts (Br)	Buttocks (Bu)	Belly (Be)	Navel (N)	Pubic Triangle (PT)	Fingers (F)	Parted Hair (PHa)	Headless (\He)	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)	No. Figs with Features	Total No. Figs
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
			Anthropomorphic Only traits							Anthro and Abbreviated traits							

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

Figure 144: Figurines with exaggerated buttocks. Photo Figurine Team

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 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 paring 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.

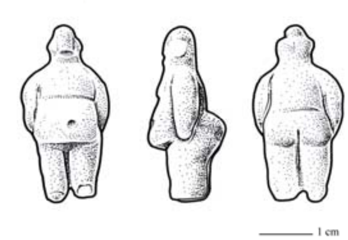


Figure 145: Androgynous figurine with navel . Drawing Katherine Killackey

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 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 Hyperotosis) that may be associated with obesity. It is an ossifying condition that produces amkylosis 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 handing 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 dicatated 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 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 opportunties 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 ad bottocks 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 strikely 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' (HarrŽ 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.

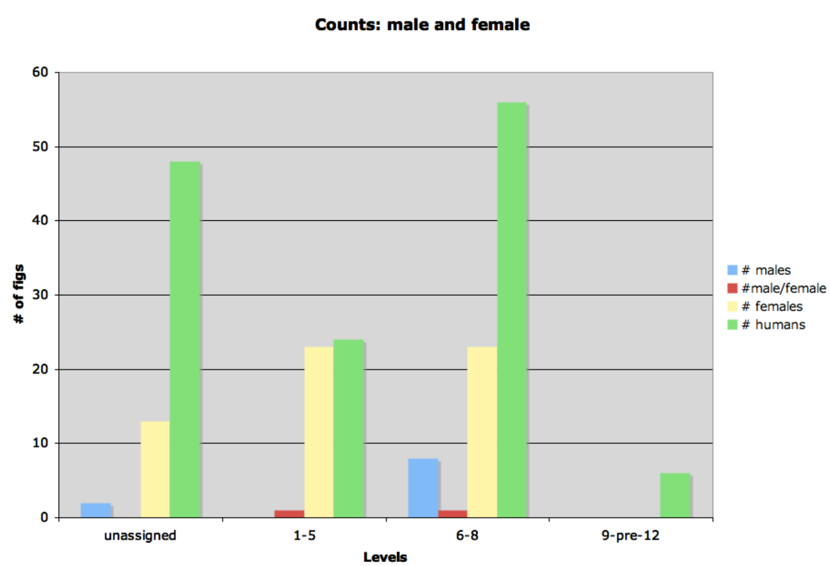
The other 'body kind' popular at the site is the abbreviated form that might in some instances also blur the boundary between anthropomorphic and zoomorphic representations. These are much more common than the strictly anthropomorphic types but have received little scholarly attention. We suggest that 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.

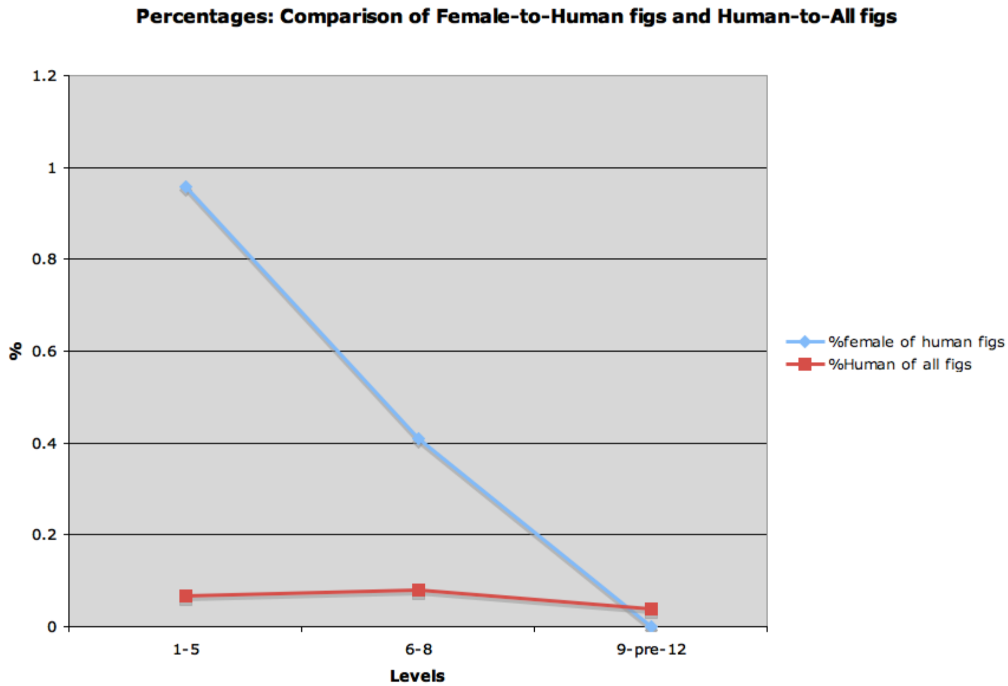
Notes on other Patterning

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.





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169.

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 misnoma. 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

<u>13360.X3. South Area. (ET149)</u>

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).

Figure 147: 13360.X3

<u>13522.X26. TP Area. (ET1)</u>

Found in midden.

Dimensions: 27mm x 22mm x 5mm.

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

Figure 148: 13522.X26

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)



Figure 149: 12980

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.


Figure 150: 12980.H7

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.

Figure 151: 12902.X1

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.

Figure 152: Stamp 13918.X1.

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.

Figure 153. Stamp 17047.X1.

17047.X1. South. (Envanter No. 10)
Found in midden deposit in Space 339.

Dimensions: 30mm x 33mmx 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.

<u>17697.X3. TP Area. (Envanter 19).</u>
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 form 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.

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

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 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 ones 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, r 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, at 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 peaces 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 reside 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 Aprahamian 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 upsilon 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.

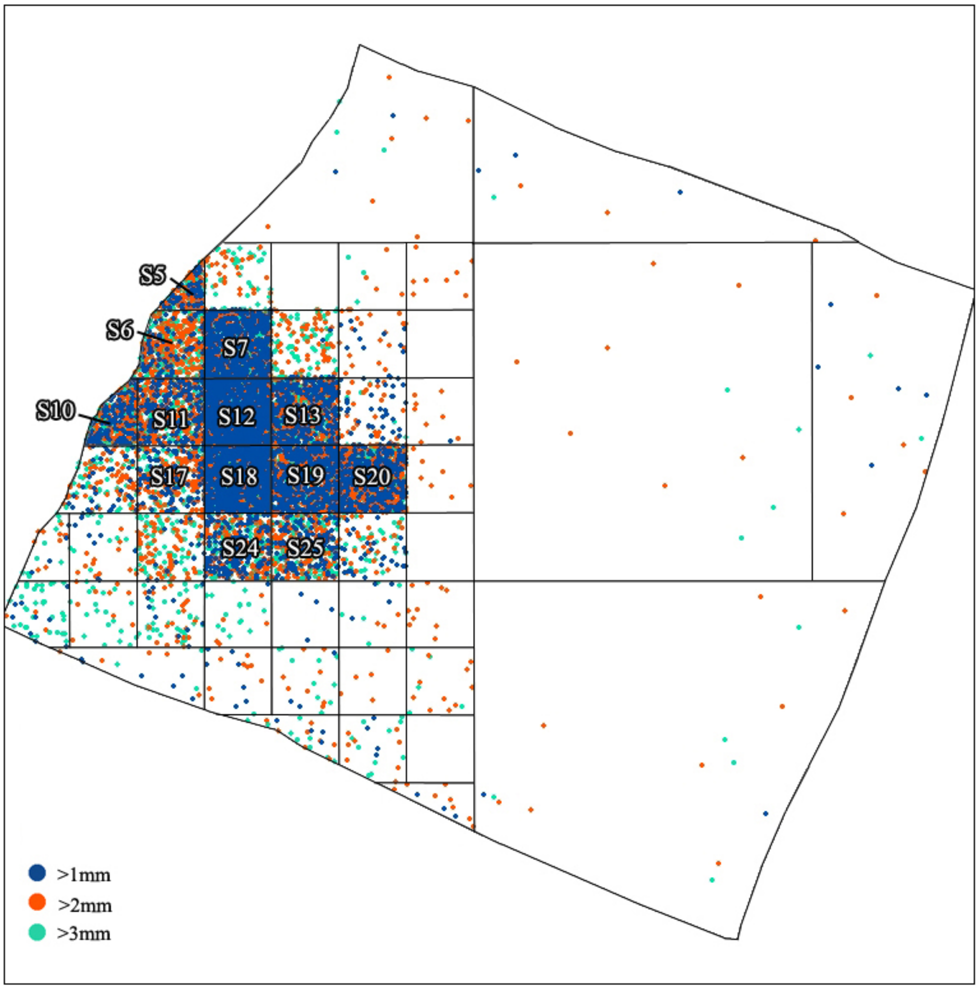


Figure 158: Density distribution of (16536)

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]).

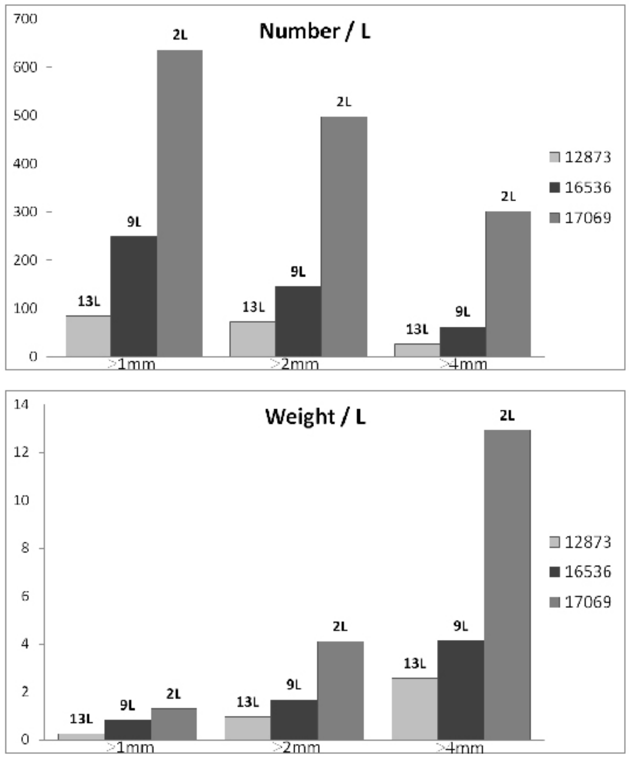


Figure 159: (12873) on platform F.2055, Building 56

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 >4m). 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 assymetric 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).

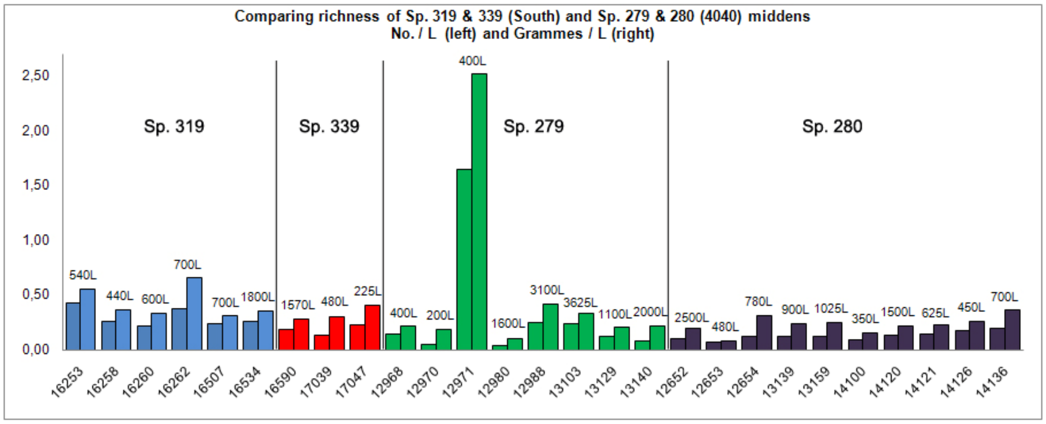


Figure 161: Richness of deposits

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.


Figure 162: Mirror fragment 16568.A1, Space 319

- 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 Dag 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).

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 Nejla 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 Kaletepe 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 (*dark blue*)	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 (*yellowish*)	??? currently unknown
17. Intensively back sprinkled	Nenezi Dağ (?)
18. Opaque black shiny	Nenezi Dağ / Göllü Dağ / East Açigöl 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 - 166This 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 reside 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 techno-typologically 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).

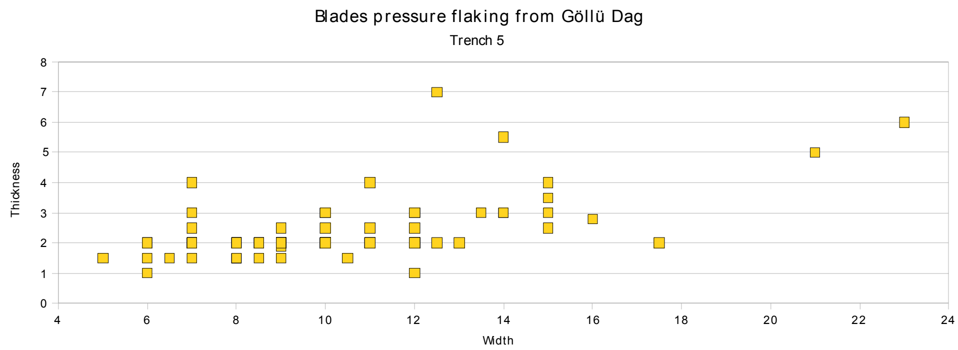
Blades were usually recovered in a broken state, fragmentation all seemingly occurring naturally, rather than through deliberate human action (i.e. through their use and a range of post-depositional processes). Complete blades are rare and they unfortunately thus far only come from insecure contexts. 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



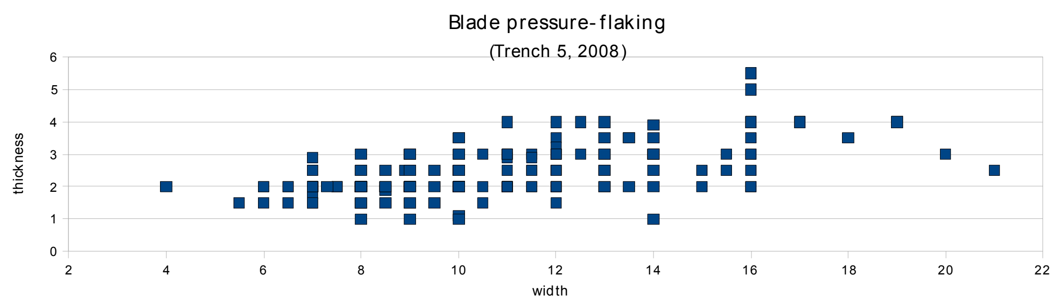
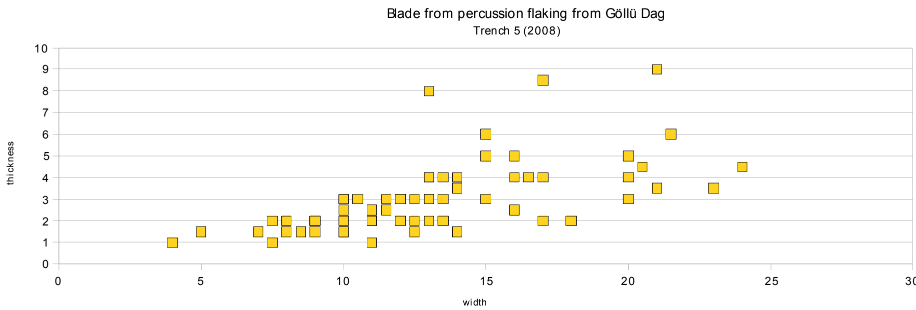


Figure 164: *Width/thickness comparison of East Göllü Dağ and Nenezi Dağ pressure-flaked blades from Trench 5*



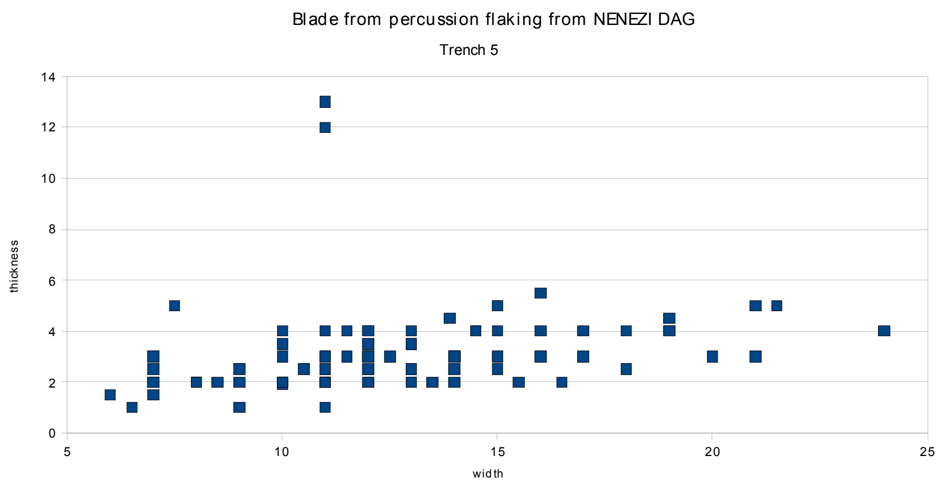
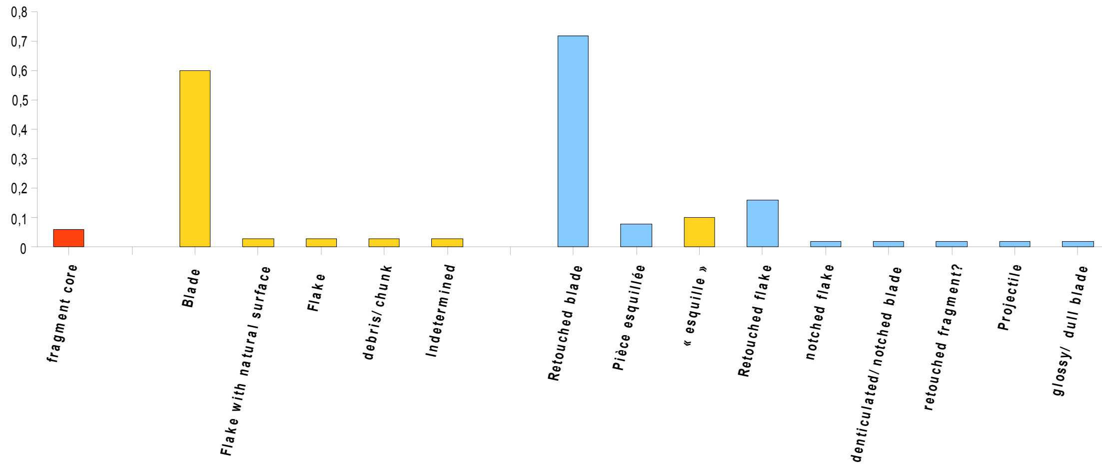
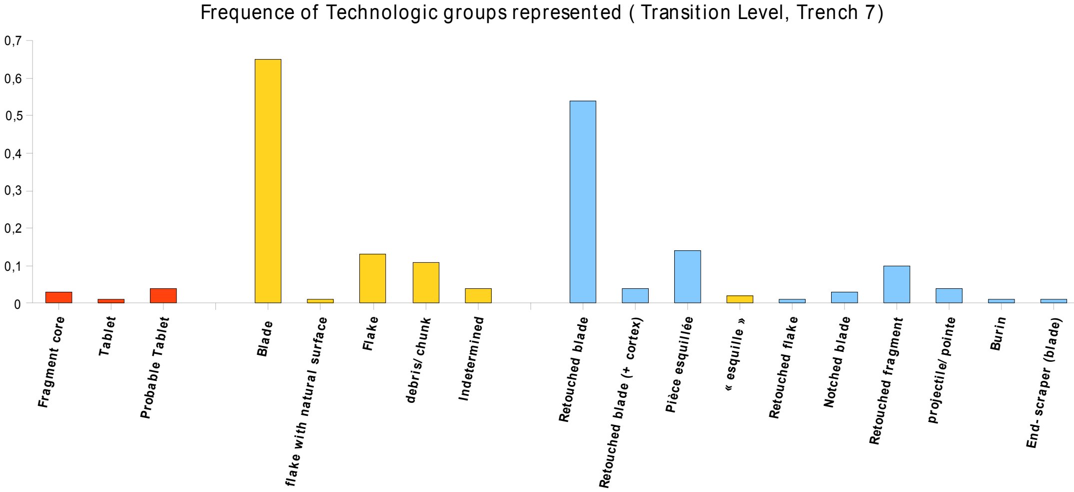


Figure 165: *Width/thickness comparison of East Göllü Dağ and Nenezi Dağ percussion flaked blades from Trench 5.*

Frequence of Technologic Groups represented
(Late grave Trench 7)



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



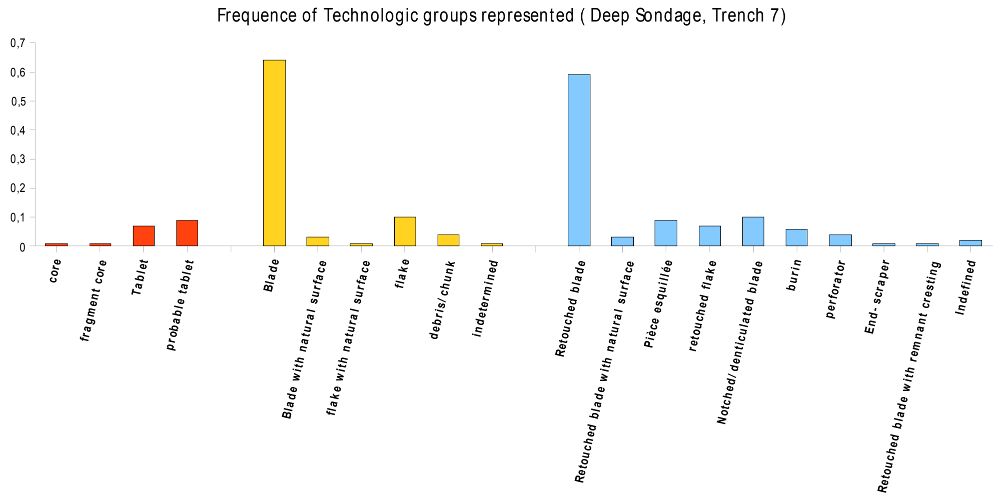


Figure 166: *Technological classes represented in Trench 7.*

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 arrises	
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 facetted 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 that 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 tablet 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 scaring, 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 H_2O 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, Early Chalcolithic II: TR II Level III-IV (4040): Bdg. 54, spaces 265-266; Bdg.55, spaces 247, 256-258; Bdg.58, space 227 Level IV (4040): Bdg.44; Bdg. 67 Level V (4040): Bdg.56 Level V-VI (4040): Bdg.51, space 98 Level VI (4040): Bdg. 65 Level VI-VIII (North): Bdg. 5	Level VII (4040): Bdgs.40; Bdg. 47, Bdg. 52, Bdg. 60, space 105 Level VIII (South): Bdg.6 Level IX (South): Bdg.2, Bdg.16 Level X (South): Bdg.9; Bdg.18; Bdg.23 Level XI (South): space 181 L.XII (South): spaces 181, 199 Level Pre-XII (South) 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 Souring 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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Stone Bead Technology at Çatalhöyük - Roseleen Bains and Katherine (Karen) Wright

Institute of Archaeology, University College London

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 (≤ 2.5mm) 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, Katheryn Twiss, Başak Boz, Mihriban Özbaşaran, Sarah Jones, Tristan Carter, and Jules Cassidy.

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SUPPORT TEAM REPORTS

Çatalhöyük 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 streamling 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 up coming 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 (acyrlic 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).


Figure 170: Bucrania during and after conservation.

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.


Figure 171: Building 52 and the Bucrania after conservation

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.

Figure 173: Conserving the bins in Building 5

Figure 174: Conserving the oven in Building 5

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.

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)

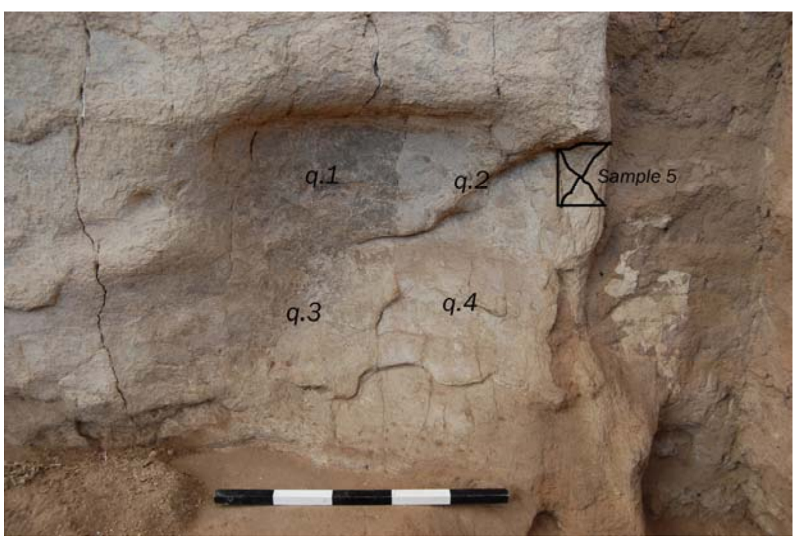

Figure 175: Building 5, F.245 in south wall (F.244). Photo Kelly Caldwell

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 that 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 it's 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.

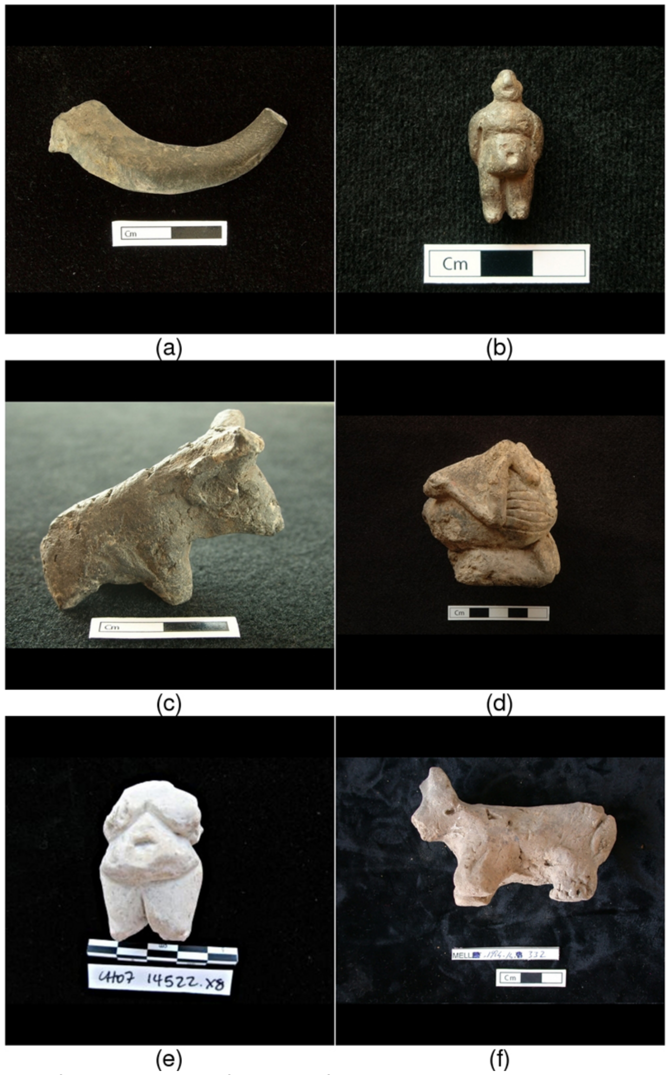

Figure 177: A wide range of materials in used for making figurines.

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.

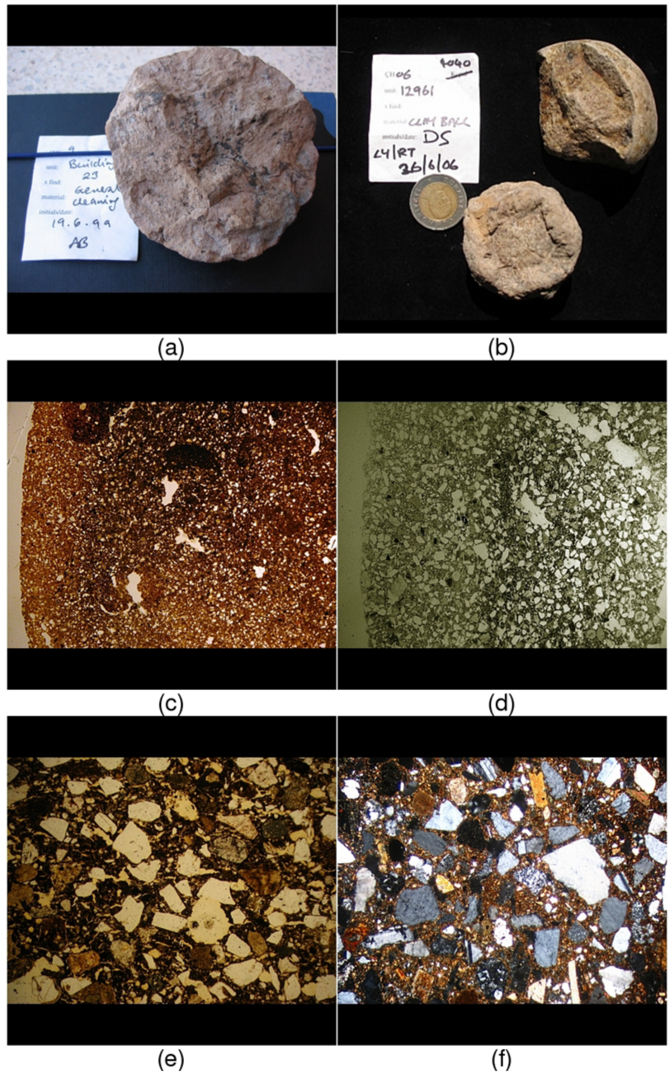

Figure 178: The polygonal internal fracture patterns seen in many clay balls. Image Clay Sourcing Team

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 sphericit, 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 sediment 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 mulitple 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 the 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, who's 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 Apppendix). 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 veiwpoint 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 is 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.

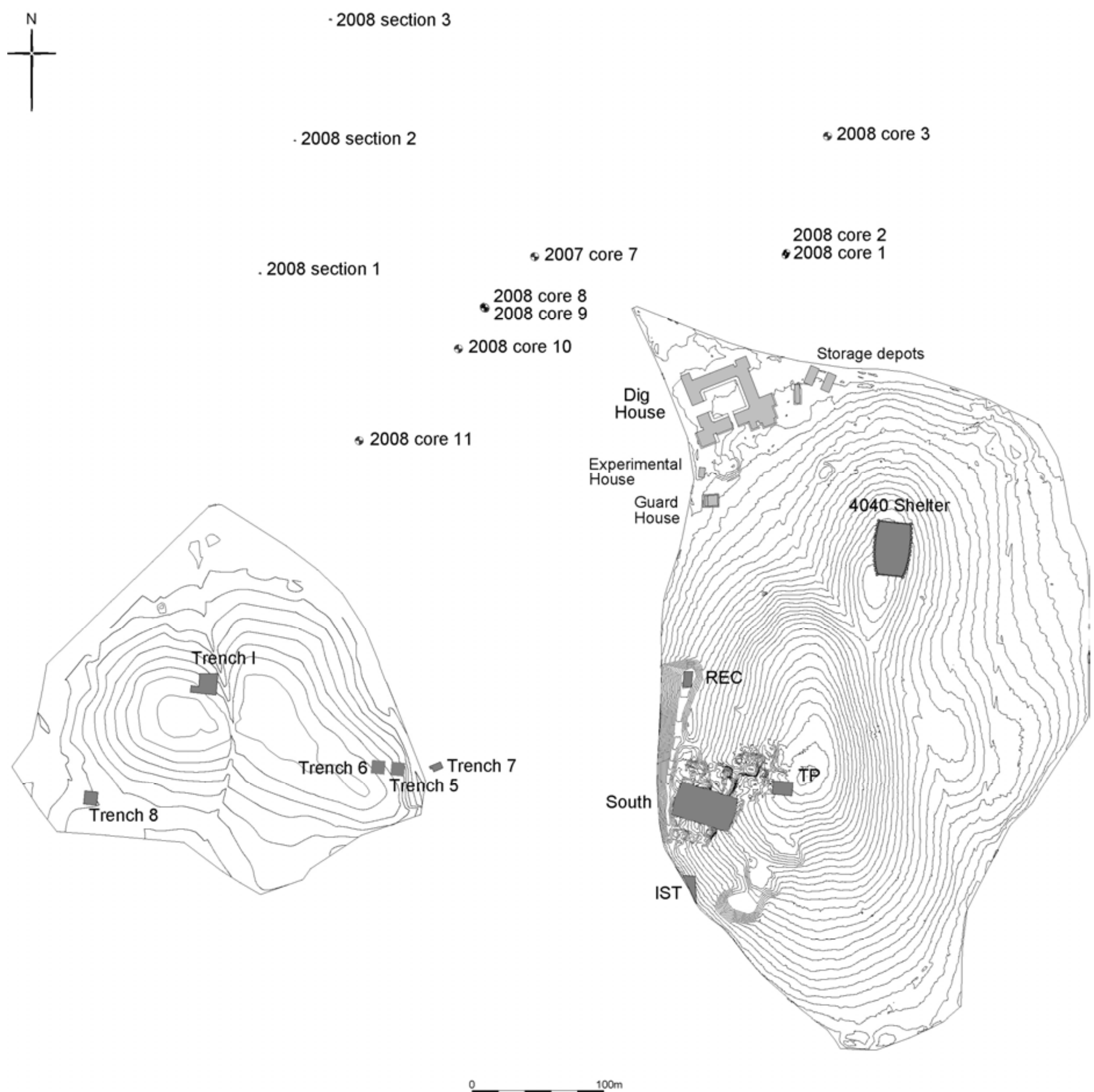


Figure 180: Location of cores 2008 to north of Çatalhöyük East and West. Plan David Mackie

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 and 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 it 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.

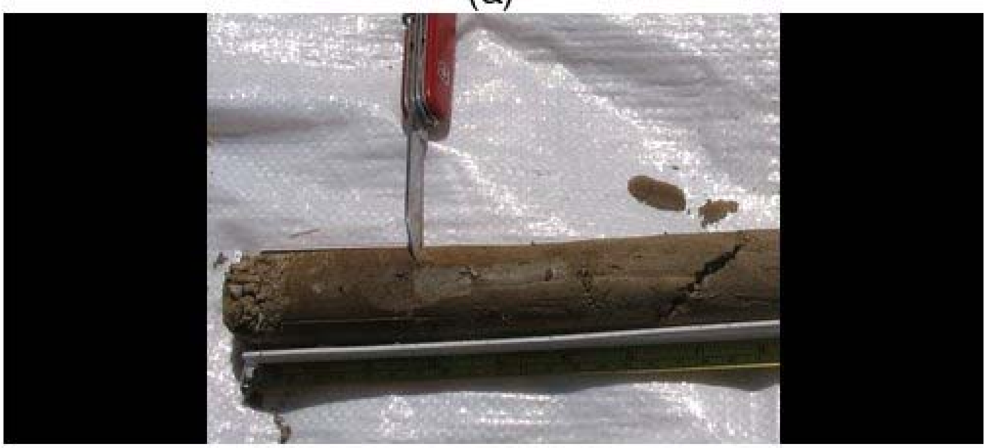
(d) Even if some Lower Alluvium had been removed for mudbricks, this would still have left a depression prior to the deposition of Upper Alluvium.

(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).

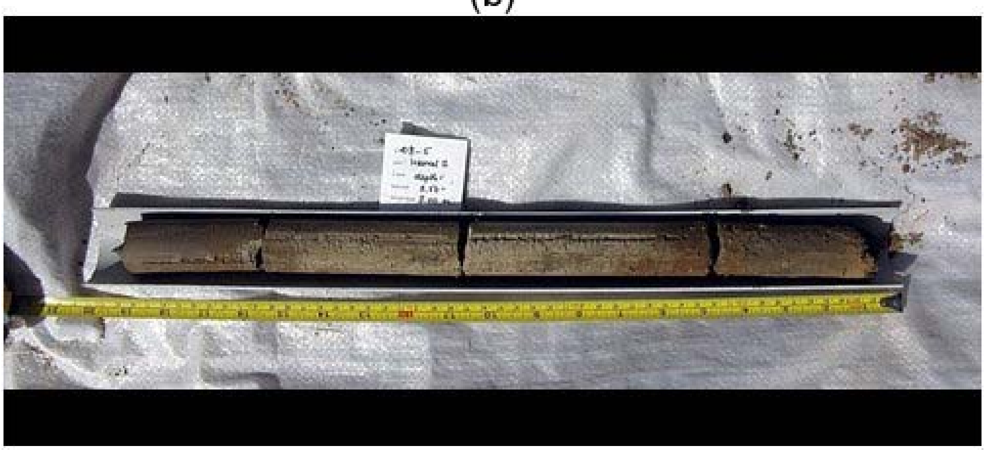
(f) The Lower Alluvium-Upper Alluvium boundary is just above 4m depth at this point whereas it is between 2 and 2.5m in cores 1+2 (and 1.5m in core 94B, the nearest taken by earlier studies (Boyer, 1999). This boundary is therefore also demonstrated to be time-transgressive

(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

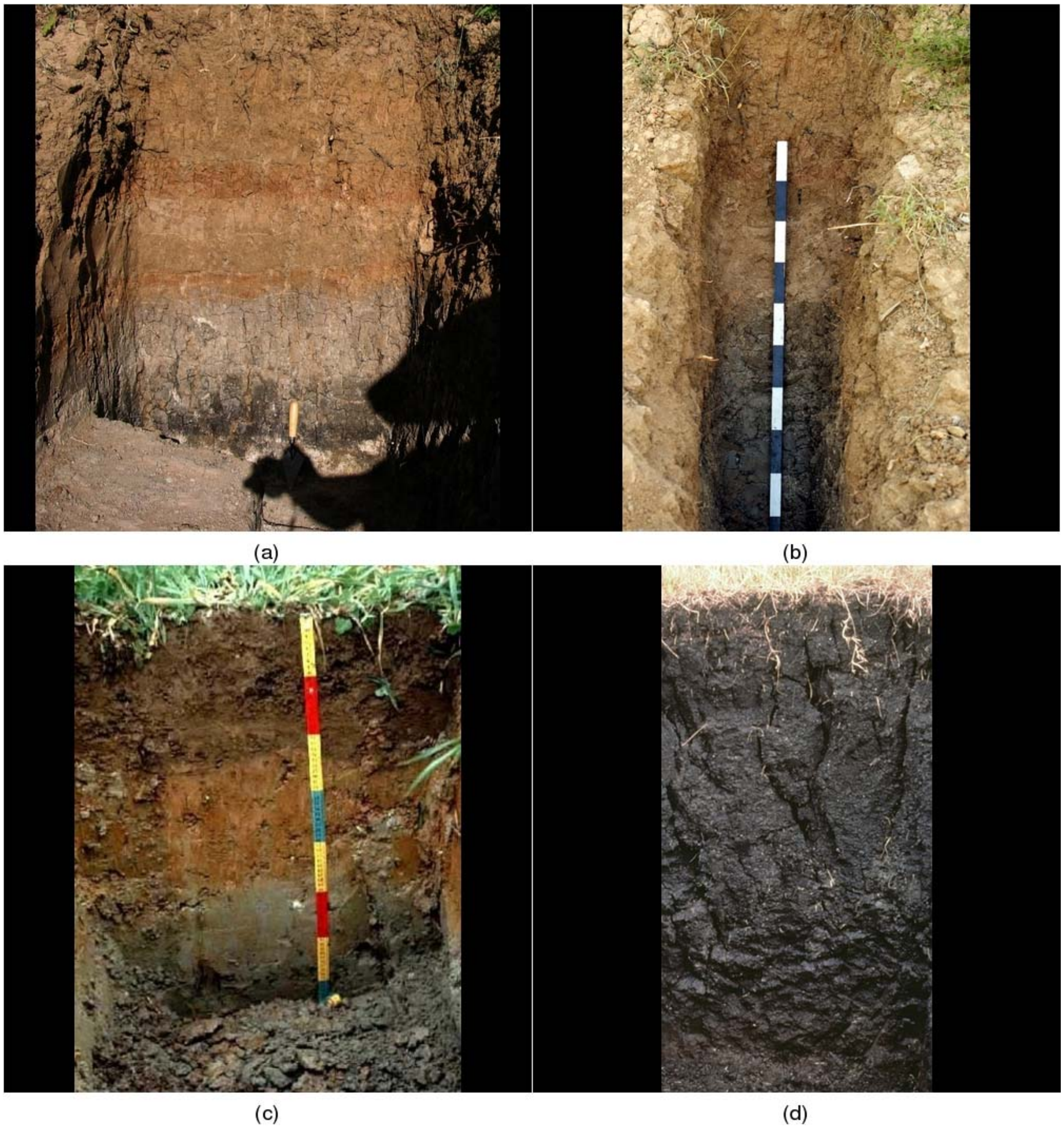


Figure 182: Sections on the east side of a dried up canal within the ancient Çarsamba River course. Photo Core Team

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 being reddened by contact with the Upper Alluvium and/or as a result 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 it's 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 though 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 grown 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 Özakın (2) Kayhan Ata (2)

(1) Trakya University (2) Boshourus University

A project initiated by Doç. Dr. Burçin Erdoğu 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 speleotems (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 speleothems 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 speleothems.

Methodology of this project as follows;
1. Creating an inventory of the Çatalhöyük speleothem artefacts.
2. Recording and sampling caves for speleothems.
3. To source Çatalhöyük speleothems through trace element analysis.

Çatalhöyük speleothems can be analysed by ICP-MS "Inductively coupled plasma mass spectrometry" to explicitly identify the location of the caves. Trace elements from Çatalhöyük's speleothems 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 speleothems 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 Özakın 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 secred 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 hidrothermal 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.

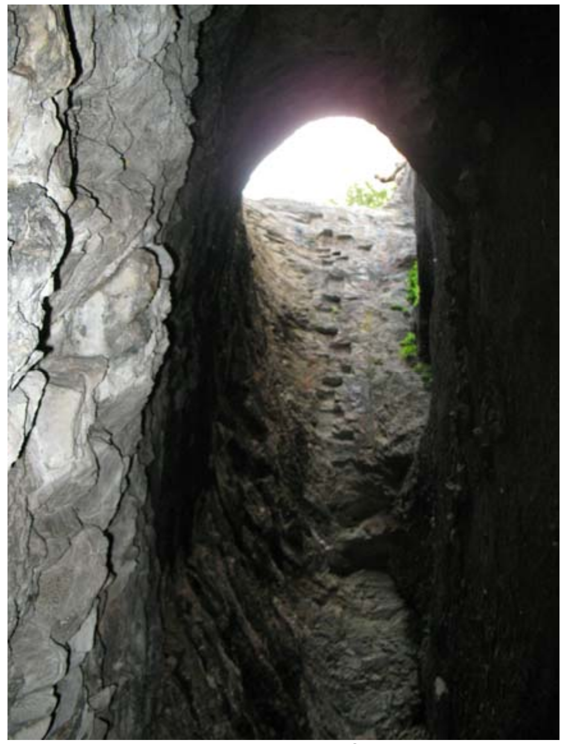
Figure 184: Ferzene cave entrance in Seydişehir at the skirt of Taurus Mountain. Photo Gülgün Gürcan

In many cultures caves are sacred places where one can pass to the spiratual 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.

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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 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

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

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.

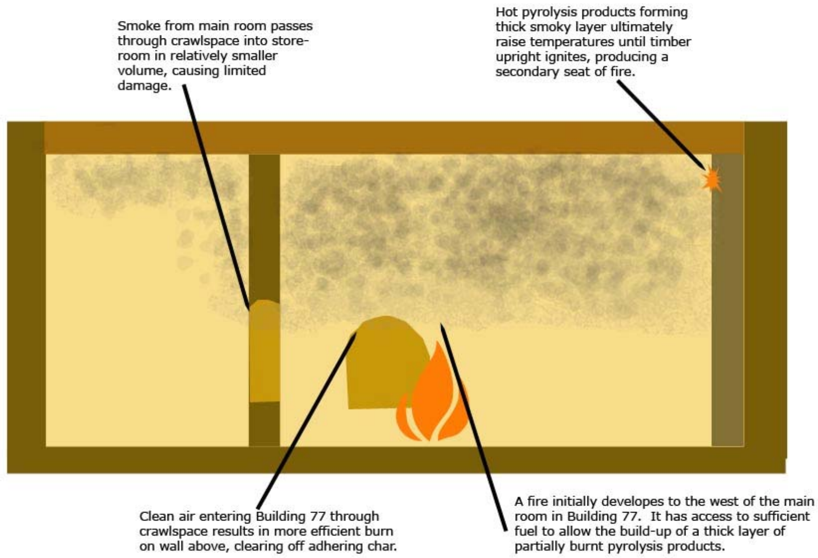

Figure 188: Section through Building 77, detailing potential model of fire development (not to scale)Image karl Harrison.

Figure 189: Niche in north wall. Building 77

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.

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

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 quantative 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 quantative 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.


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

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 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…

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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).

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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=64DlgYzQVkc

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 Özarslan and Latife Sema Bağcı, both MA students at Middle Eastern Technical University. During our four weeks at Çatalhöyük, we completed several projects aimed at engaging the local residents living in five villages near Çatalhöyük .These projects included: 1) a community day at Çatalhöyük; 2) interviews with community residents; 3) a science cartoon about the archaeology research at Çatalhöyük; and 4) a community newsletter about the research at Çatalhöyük. 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 Kücükköy 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 Çatalhöyük were explained. There were also activities specifically for children conducted by Gulay Sert, who runs a daily kids camp at Çatalhöyük. 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 effects 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

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

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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

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OX1 3QY

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…).

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 basin 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 fluviatile entre en jeu. La rivière May traverse des terrains volcaniques avant de rejoindre la Çarsamba au niveau de la bordure du Basin 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. Amoung 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 – propostion 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.

1. Geological and Archaeological contexts

1.1. Situation of the study

A. Geographical localisation

Çatalhöyük is an important archaeological site situated in Turkey. 11 km north of Çumra in the alluvial Konya plain [Mellaart, 1981] (Figure 1).

Figure 1: localisation of Çatalhöyük.

The term "Çatalhöyük" means "fork mound", probably referring to the fact that the Çarşamba river divides into three at the south of the mound. Catalhöyük is in fact two mounds (Figure 2). The main famous mound is Neolithic in date and is known as the East Mound, whereas the West Mound is Chalcolithic [Hodder, 2006].

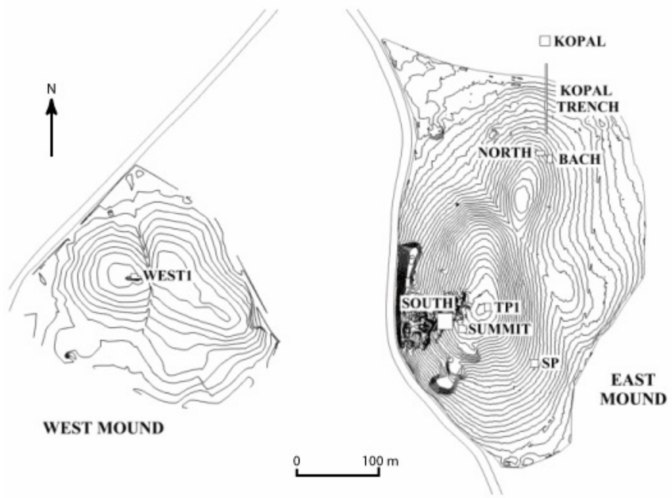


Figure 2: Overall map of the East and West Mounds at Çatalhöyük, with the main archaeologic areas [Hodder, 2006].

B. General geology of Turkey

The Anatolian plate is deformed as a result of the collision of Eurasian and Arabian plates along the Miocene thrust front (Figure 3). This collision which determines the beginning of the Neotectonic period shortened the Eastern Anatolian and is followed by the formation of the East and North Anatolian faults.

Widespread volcanic activity took place in Turkey during the Neotectonic period. Depending on these activities, volcanic rocks covered an area of about 85,000 km² in East, Central and West Anatolia [Temel et al, 1998].

Concerning the study area, in Central Anatolia, calc alkaline volcanic products cover large areas located in the west-south-west and north-west of Konya city (Figure 3). This area is surrounded by the North Anatolian Fault (NAF) in the north and the African-Anatolian convergence system in the south.

According to Keller et al. (1977), volcanic activity in this area continued from Late Miocene (11.9 Ma) to Pliocene (3.55 Ma).

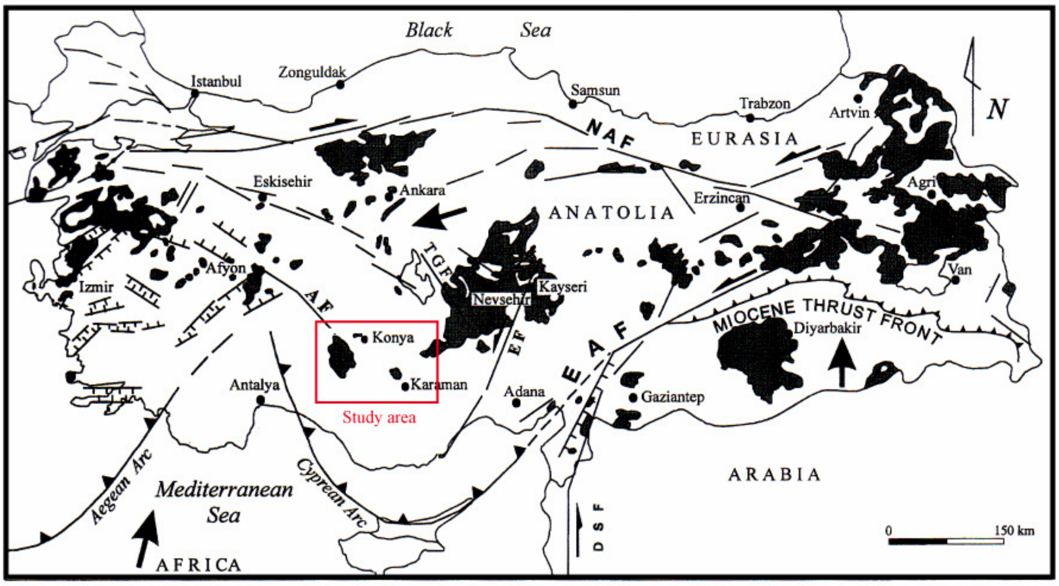


Figure 3: Localisation map of the Konya volcanic rocks, Central Anatolia (Turkey) [Temel et al., 1998].

1.2. Geological context

Çatalhöyük is located is the Konya Basin. It must not be forgotten that many of the most attractive areas for agriculture, and hence human habitation, have been alluvial plains and valleys. The attraction of fertile soils and accessible water ressources has been manifest in the Old World from the very start of the Neolthic period.

However, alluvial plains are amoung the most dynamic of all geomorphic landscapes, with spatial migration of river channels leading to the reworking and removal of archaeological sites, and zones of active alluviation progressively burying superficial archaeological evidence [Boyer, 2006].

That is why the situation of Çatalhöyük is quite problematic and in order to explain the provenance of the pottery raw materials, the understanding of the local geology is absolutely essential.

A. The Konya Basin

The Central Anatolian Plateau in Turkey is characterized by several small to large basins, some of which contain more or less extensive bodies of standing water, either fresh or salty. Other basins contain no or hardly any water at present, though there is ample evidence for the existence of extensive lakes in these basins during the recent geologic past. An example of the latter is the Konya Basin.

The Konya Basin is nearly flat over the greater part of its surface and lies at an elevation of around 1000m above the sea level, at the southern edge of the Anatolian Plateau in South-Central Turkey to the North of Taurus mountain range.

Nowadays, this basin is a roughly rectangular area of approximately 3000 km², entending some 50 km toward the east from the town of Konya, and some 60 km toward the north from the town of çumra. In easterly direction the basin narrows, and this part is called Ereğli basin (Figure 6) [De Ridder, 1965].

The basin has a tectonic origin and was formely occupied by a large lake, which formed in last galcial period (Würm). After 20,000 cal. BC, there was a general recession of lake waters and the basin has been essentially dry since the end of the Pleistocene, due to warmer temperatures [Boyer, 2006].

Once dried out, the lakebed formed a flat to gently undulating marl plain, and it is onto this surface that a number of rivers flow amoung which the Çarsamba, May, Meram and Sille are the most important (Figure 5).

The Çarsamba and especially the May are karstic rivers, loosing much water through the cavernous limestone in which their valleys have been incised. The May is an ephemeral stream, carring water only during the rainy season.

Nowadays in most of these rivers, dams have been built, so that the flood waters can not enter the plain anymore[De Ridder, 1965].

Even though the plain is nearly flat, in detail it has irregularities some of which are geological interest. The most interesting surface features are the elongated sand ridges, trending parallel along the rim of the basin. The most important sand ridge prolonges from Konya via Kaşinhani and Fethiye in the direction toward Türkmen Karahüyük in the southeast.

The large alluvial fans of the Çarsamba and the May rivers cut through this ridge near the villages of Guvercinlik and Fethiye, respectively (Figure 5).

It is upon the sediments of this alluvial feature that numerous archaeological sites from the early Neolithic onward are located primarily in the form of settlement mounds or höyük (tells) [Boyer, 2006]. Indeed Çatalhöyük is one of the most important site but it is not at all the only settlement in this part of Turkey.

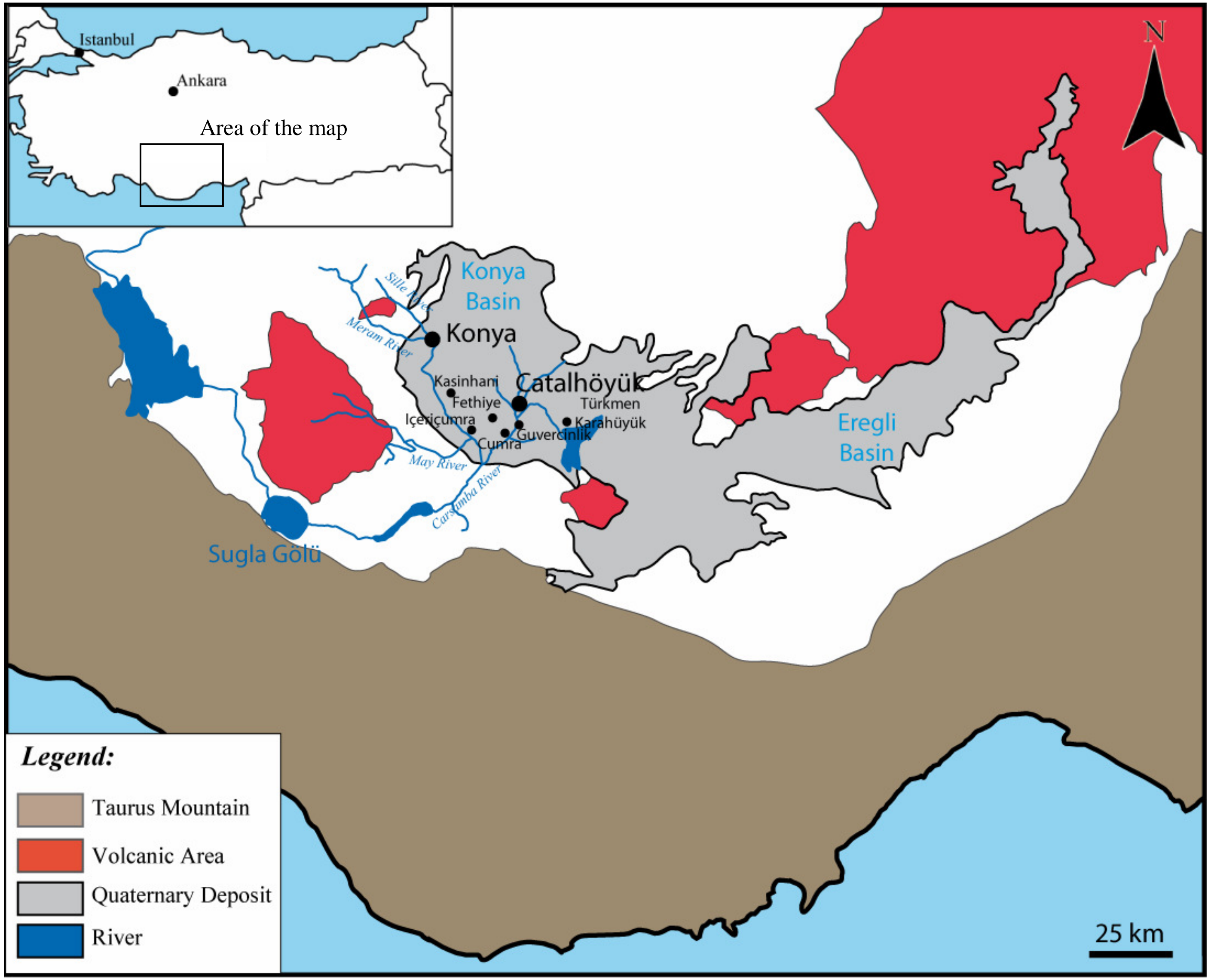


Figure 4: Localisation of the Taurus Mountain and of the Konya Basin, in Central Anatolia, Turkey.

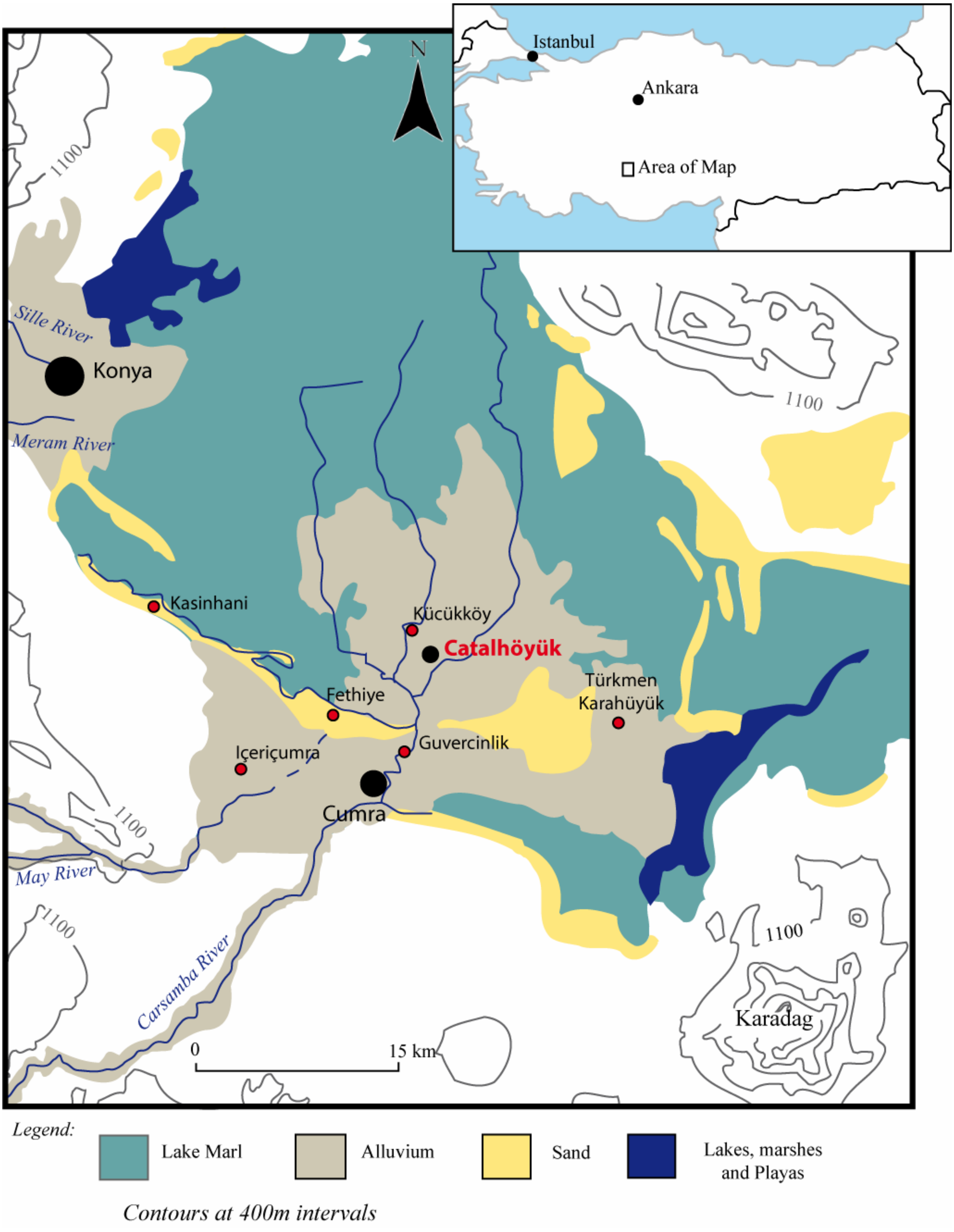


Figure 5: Detailed Map of the Konya Basin.

B. The bounding Mountains : The Taurus and the Anatolides

- *The Taurus Orogen*

The Konya basin can be characterised as a structural basin with a thick accumulation of Tertiary and Quaternary sediments, initially derived from the Taurus orogen to the south and west.

This orogen is a very complicated group of mountains, showing much variation in their stratigraphic and structural features. It is chiefly composed of Devonian and Permo-Carboniferous limestones and schists and Mesozoic (Cretaceous) limestones.

Between the Taurus orogen and the Central Anatolian Plateau lies a zone with several volcanoes, some of which were still active in historic times. Volcanic rocks as andesite, dacite, basalt and tuff, are widespread in the mountains bordering the Konya basin to south and west [De Ridder, 1965].

- *The Anatolides*

The basin is bounded to the north and east by the Anatolides, a mountain chain chiefly composed of Palaeozoic sediments, schists and igneous rocks and covered by mesozoic limestones.

During the Tertiary upfolding of the Anatolian orogenic belt the inner Anatolian dome broke and susided with respect to the flanks. As a result, large depressions were formed which became the sites of large inland seas during the greater parts of the Tertiary and Pleistocene.

During the Oligocene thick layers of clay were deposited, rich in gypsum.

During the Neogene alternating sedimentation of clay and fresh-water limestone took place. These limestone series crop out at several places along the rim of the basin, especially in the south, near Çumra, but also to the north of Konya [De Ridder, 1965].

C. The Lake Alluvium

- *The current interpretation*

The total thickness of the sediments in the Konya basin is unknown.

The basin sediments include clastics (clay, marl, sand, gravel and conglomerate), as well as non-clastics (limestones).

The limestone is characterized by a lack of a marine fauna and is therefore a fresh-water limestone. The colour is whitish to light grey and grey. It is hard and cavernous. Although rather thick beds of pur limestone occur, thin layers of calcareous clay and marl are found intercalated at many places.

Reversely, thick layers of marl interbedded with limestone are also found. The greater part of the limestone must have been formed in situ as a chemical or biochemical precipitate from the lake water during the Neogene. It is possible that also during certain periods of the Pleistocene limestone was formed, but no evidence for this statement can be provided [De Ridder, 1965].

In the western part of the basin red clays, described as terra rossa, are interbedded in the limestone series. The number, thickness and depth of these terra-rossa horizons vary from place to place.

These terra-rossa horizons indicate a dry-land phase. Since they have a fairly irregular distribution it can be concluded that during certain periods of the Neogene some parts of the basin were dry, giving rise to a deep weathering of the limestone.

The influence of the May river is reflected by a relatively great thickness of the clastic sediments in the Içeriçumra-Fethiye region.

The overwise scarce data from the Çarsamba valley seem to indicate that this river has incised a less deep erosion valley in the limestone than the May river. These erosion valleys have probably been formed at low lake levels during the Pleistocene [De Ridder, 1965].

In 2006, Boyer et al. proposed a interpretation of the Holocene environment and settlement on the Çarşamba Alluvial Fan.

In short, two principal alluvial deposits are recognised for the Holocene, labeled as the Lower and The Upper Alluvium.

A thin (<20 cm) layer of very dark organic clay directly overlying the basal marl (Pleistocene) separates it from the Lower Alluvium (Figure 6).

1) <u>The Dark organic Clay</u>

The organic clay varied in thickness up to about 1m, and 14C dating suggests a deposition around 9800-9400 cal. BP. This sediment unit may have formed in a number of discrete depressions that provided foci for standing water sedimentation at the very beginning of the Holocene, prior to true alluvial accumulation [Boyer, 2006].

2) <u>The Lower Alluvium</u>

It consists of around 1.5 m of dark grey-brown, smectite-rich alluvial backswamp clay.

The base of the Lower Alluvium has given ages of 9500 cal. BC, just prior to the earliest known Neolithic occupation at Çatalhöyük; the settlement was, therefore, established during a phase of active alluviation by the Çarsamba river.

The very fine-grained nature of the Lower Alluvium backswamp clay indicates extended periods of flood inundation following spring snowmelt. Such wet conditions are consistent with the existence of early Holocene lakes and mashes elsewhere in the Konya plain.

The contact between the Lower and the Upper Alluvial units is sharp and interpreted to represent a sedimentary hiatus [Boyer, 2006].

3) <u>The Upper Alluvium</u>

The Upper Alluvium overlies this unit, around 1.3 m of reddish-brown alluvial silt-clay.

Deposition of the Upper Alluvium was restricted to a more central area of the fan than was the case with the Lower Alluvium. The main period of alluvial sedimentation in the distal part of the fan ended before the Iron Age and later phases of settlement, whereas on the central regions of the fan, around 1.5m of alluvium has built up during the historical period [Boyer, 2006].

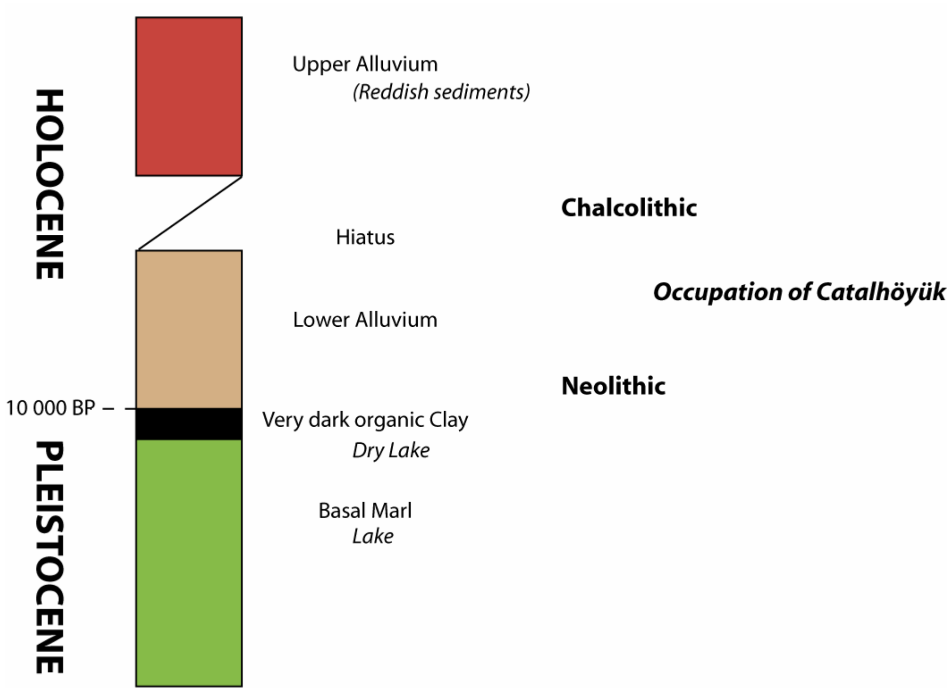


Figure 6: Simplify Log of the Konya Basin Units.

1.3. Clay Sedimentology

The primary raw materials for ancient ceramics were local clay-rich sediments and soils for the paste and coarse sedimentary particules for the temper[1] [Rapp, 2002].

The clay particles represent the most common components of the clay fraction of sedimentary rocks, in which they occur as individuals or as aggregates of various sizes and shapes. Clays may be defined from several points of view:

- The clay minerals refer to a particular group of minerals defined according to their specific chemistry and crystal structure [Velde, 1999].
- The clay fraction of a given rock is conventionally considered as the fraction less than two µm diameter. This fraction may include many other components beside clay minerals, like aluminium or iron oxides, carbonates, phosphates, free silica, various aluminosilicates and organic matter [Chamley, 1989].

A. Sedimentology

Clay minerals form as a product of weathering, as a product of pedogenesis, and as a deposited sediment.

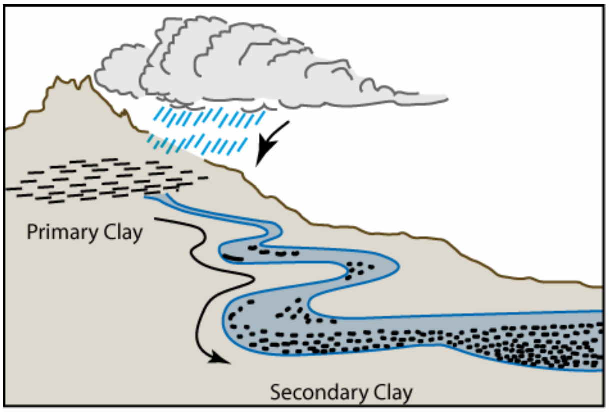
With rare exceptions, such as some kaolinite deposits, natural clay is not a single mineral but rather an aggregate of minerals and colloïdal substances. All natural clays contain both non-clay mineral and material larger than clay sizes [Rapp, 2002].

Clay deposits are of two general types (Figure 7):

(1) Clay which occur in their place of origin are called primary clay. They are the end product of a chain of reactions and are therefor also called residual clays.

(2) Clays which have been transported from their place of origin and settled elsewhere are called secondary clays or sedimentary clays [Hammer, 1997].

Figure 7: Two type of clay deposits [from Hammer, 1997]



B. Clays and Ceramics

Ceramic production has always been an empirical art and the choice of raw materials was one of the most important aspect [Rapp, 2002].

There is the idealized clay mineral (the kaolinite) which is always considered to be of chemical purity though of variable-sized crystals; and there is the clay which all potter know as their fundamental material which seems to bear little relationship to an ideallized substance but is a variable, responsive material.

The properties of clay upon which pottery depend are the workability which allows forming and retention of form; and the property of ceramic change to a new material by heat [Hammer, 1997].

[1] *Temper* : a term used for inclusions which are considered to have been added to the raw clay. The function of a temper is to improve the forming and firing properties of the clay.

1.4. Archaeological Ceramics

A. Definition of a ceramic

The term "ceramic" derives from the Greek keramikos from keramos which means "potter's clay, pottery". It is quite hard to define precisely this word but one definition calls ceramics, "the art and science of making and using solid articles which have as their essential component, and are composed in large part of, inorganic nonmetallic materials".

The word ceramics has two sets of overlapping meanings, i.e. set common to materials science and another employed in art and archaeology, which complicates its precise definition and usage.

But in this study, it is the term employed in art and archaeology which is of interest. In this case ceramic usually excludes construction or industrial products. Within these fields, ceramics refers to cooking and serving utensils and objects d'art manufactured of clay.

Even here the term is sometimes employed more specifically to distinguish ceramics – high-fired, usually glazed, and vitirified – from pottery, which consists of low-fired, unvitrified objects and/or cooking and storage vesseld [Rice, 1987].

- *Potteries at Çatalhöyük*

At Çatalhöyük, the lowest building level (XII) to be excavated has pottery, and it is quite possible that potterymaking goes back farther still. This earliest recovered ware is cream-coloured and burnished; frequently mottled grey, with some straw temper, coiled and medium fired. It predominates from level XII till level VII.

In VIII, however, the first dark burnished ware with a grit temper, better firing, higher burnish and thinner walls, appears but in the same shapes. It is still of local manufacture. By level VII it has ousted the earlier ware. A red wash, already found in level XII, continued to be used, and from level VII a small percentage of the pottery is red-washed or red-slipped.

In the latter levels – from IV onwards – mottled slips become common, and by level III fine buff-shaped vessels are made in sophisticated shapes. Painting in red is attemepted once or twice, but other forms of decoration are virtually unknown [Mellaart, 1981].

B. Definition of a fabric

A fabric is a term used to describe the overall appearance of a pottery sample. In the field, archaeologists classify ceramics according to the colour, the shape, the function and the context of the sherds. A major aiml of petrographic analysis of pottery samples is to verify or to alter these fabric classifications made in the field.

Geologists consider a ceramic through:

- its body which is the matrix of fired clay (~70-80% by volume)
- its inclusions which refer to all non-clay bodies.

Except for very fine-grained ceramics, the bulk of the possible observations that can be made of pottery fabrics concern the inclusions. These latter can be defined according to two viewpoints:

- - a compositional viewpoint with, for instance, the ratio of limestone to volcanics, the type of limestones, the type of volcanics, the other inclusions, the internal textures and the mineral chemistry,...

- a textural viewpoint with the size of the inclusions, the sorting, the rounding, the weathering, the occurence of thermal alteration,...[Doherty, 2006].

1.5. Archaeological Data

A. History and Organisation of Çatalhöyük

- *Chronology*

The chronological scheme varies according to the area and the civilisation. Concerning the Central Turkey, we consider:

- the Palaeolithic which is the period of the hunter-gatherers;
- the Epipalaeolithic cultures with distinctive types pf stone tools, and some tenndencies towards aggregations of small groups and more sedentary lifestyles;
- the Neolithic cultures caracterised by large and sedentary sites with intensive exploitation of animals and plants. Pottery is introduced in this latter period (Figure 8).

Çatalhöyük comprises two separate prehistoric occupation sites. The Neolithic East Mound (7400-6000 BC) that has been the subject of most archaeological excavations, and the Chalcolithic West Mound which has started by 6000 BC and continues into the early 6th millenium BC [Hodder, 2006].

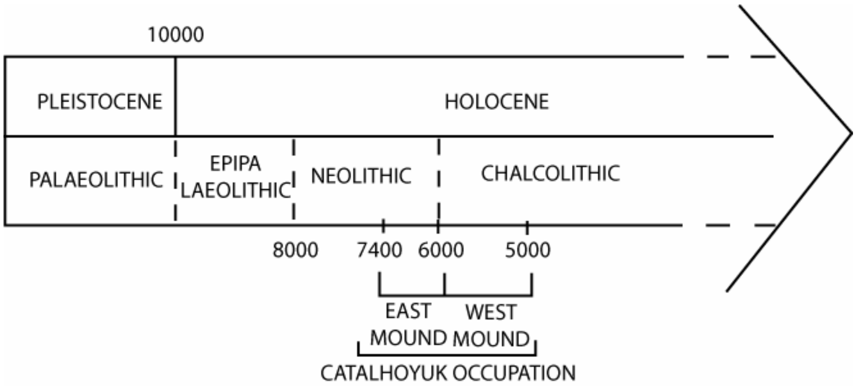


Figure 8: Simplify Chronology and Occupation of Çatahöyük.

- *Organisation of the site*

The town extented over a massive 13.5 hectares.

The East Mound is a large mound, 21m high mound, approximately 600x350m. It was inhabited for about 1400 years. There are 18 levels of occupations as people abandonned old houses; filled them in, and built new ones on top [Hodder, 2006].

At the end of the Neolithic, this site was deserted for a new location, Çatalhöyük West, across the river.

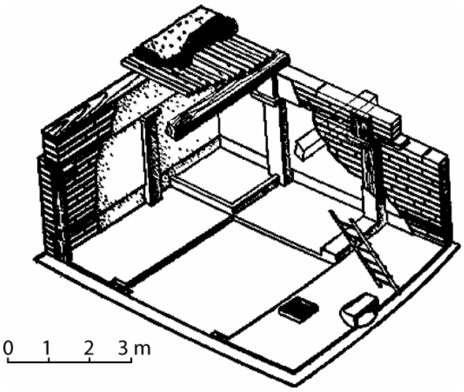
The economy on Çatalhöyük was based on simple irrigation agriculture and cattle-breeding, trade and industry.

Yet the fact remains that it was only the use of the river on which Çatalhöyük is situated for irrigation that made agriculture a success in this wide open plain [Mellaart, 1981].

- *Organisation of the "town"*

Houses at Çatalhöyük show a standardized rectangular plan, usually covering about 25 sq.m of floor space; smaller ou larger houses are uncommon. They consist of a large living-room and a smaller storeroom, entered thought a low doorway (without door) or a port-hole raised above the floor. Access to the house was through a hole in the roof and a wooden ladder fixed against the south wall, which was also acted as a smoke hole for the hearth and oven on the floor underneath. Roofs were flat and a veranda of light inflammable material covered part of the roof. Each house had its own walls and roof levels would have been staggered to admit light (Figure 9).

Figure 9: Organisation of a typical Çatalhöyük Building.



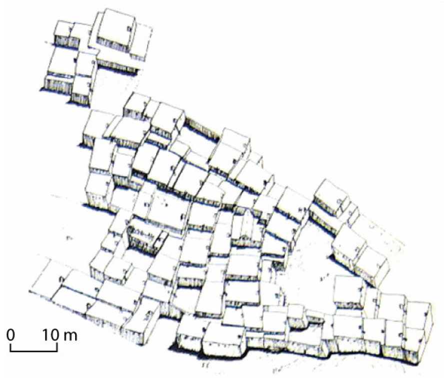


Figure 10: Organisation of the "town".

Houses were closely built up against each other though there were some courtyards, usually ruined houses of a previous level not rebuilt, to serve for rubbish disposal and sanitation. There were (few or) no streets, lanes or alleys, and all communication was at roof level [Mellaart, 1981] (Figure 10).

Each buildings was probably lived in by a family of 5 to 10 people.

The main room were quite bright, the white plastered walls were frenquently renewed and often burnished and so they reflect light well [Hodder, 2006].

B. Excavation Projects

- *Mellaart Excavation*

The site was first found and excavated by James Mellaart in the late 1950s and early 1960s. Working for Britain, Mellaart was a young scholar setting out to show that the earliest farming villages not only occured, as had been thought, in the Levant and adjacent areas in the Middle East, but also in Central Anatolia. In each occupation level at Çatalhöyük he excavated up to 30 buildings – overall about 160 of them spread over the different levels.
Despite excavating for four years between 1961 and 1965, Mellaart only uncovered a small part of this huge site [Hodder, 2006].

- *Hodder Excavation*

The excavations changed our understanding of the early farming villages who started the road to complex civilisation, but many question were left unanswered until, in the early 1990s, a new campaign of research was initiated by Ian Hodder [Hodder, 2006].
Beginning in 1993, the current project has excavated or planned a further 80 buildings. It included site excavation, an archaeological field survey, and off-site paleoenvironmental investigations [Boyer, 2006].

2. Context of the study, Materials & Methods

2.1. The Çatalhöyük Material Project

This aim of this project is to use geological knowledges in order to understand the numerous ceramics discovered during all these years of excavations. It is organised into four main schemes:

- First, petrogaphical observations of thin-section in order to determine the main groups of clay-based materials and their provenance;
- Secondly, chemical analysis of blocks by SEM to characterise the clay body, precise the chemistry of the inclusions in order to support the first observations and conclusions;
- To begin a new reference collection of Çatalhöyük pottery fabric (*see Appendix 1*) in order to concentrate the data of the different teams;
- In the same time, a campaign of cores around the site has been performed in order to test the ideas of where the raw clays were being sourced in the Konya Basin.

A. From the archaeologist point of view

Due to the important size of the site, it has been split into several areas. Each area is directed by one independant team and in this way it is quite complicated to concentrate the data.

However some general observations could have been done and are sum up below.

- The earliest pots were organic tempered and there is no evidence they were used for cooking.
- But both pottery and lithic technologies change around Level VI (~6500 to 6400 BC).
- Compared to the Neolithic potteries, in the Chalcolithic West Mound, pots are more elaborated. Most of them present slips or surface decorations which used themes similar to those used on the Neolithic walls [Hodder, 2006].

Conventionally, the study of archaeological pottery focuses on external characteristics such as the shape of the vessel and any surface decoration. Colour is often the first characteristic used to describe and classify pottery as it is the most immediately obvious feature.

Form and colour studies provide information for relative dating, assessing the status of a site, identifying patterns of trade and exchange.

However colour is dependant not only on the type of the clay used but also on the degree to which this has been fired and most of the time archaeologists have at their disposal only of small pottery fragments, complicating the identificationg of the shape for the specialists [Doherty, 2006].

B. What bring the geological knowledges

At this latter point, geologists can bring their knowledges up and help archaeologists in their search of truth. Petrology is one of the most important branch of geology which is used in order to understand ceramics.

It contributes in three main ways:

- By providing a description of the pottery, it is possible to verify fabric groups established by the archaeologists;
- By demonstrating how the raw materials were used and how the ceramics were formed, insights can be gained into the technological aspects of manufacture;
- In favorable cases it may be possible to match distinctive mineral types or chemical compositions with known geological occurences and suggest a possible source for the ceramic raw material [Doherty, 2006].

C. Two complementary sciences

Working with ceramics implies a human factor for the geologist. When studying them, he must always keep in mind that the raw material may habe been modified by the potter in order to improve the final properties of the object. The geologist has to learn how to read these evidences – through the repartition, the shape, the type of the inclusions – in order to distinguish natural inclusions from added tempers.

But the geologists have to concentrate on the geological facts only and it is to the archaeologists to replace the data onto the historical context.

Scientific pottery analysis is employed when there are uncertainties or when there are questions of specific interest that can only be addressed by more detailed analysis. Çatalhöyük is none of the exception, the archaologists have already done a first classification work on the ceramics. The labels are based on colour or shape observations and each team has a particular way of working. The aim of the geologists is not to repeat previous work but to complete this work with geological data which could aid in determining the source of ceramic raw materials.

To sum things up, archaeologists tell the human context of the artefact when geologists tell informations concerning pottery raw materials, method of forming, firing, use... thanks to the study of the inclusions and their distribution.

These two sciences are definitely complementary, combined their informations would facilitate the understanding of the site and in one way of the Çatalhöyük society.

2.2. Presentation of the materials

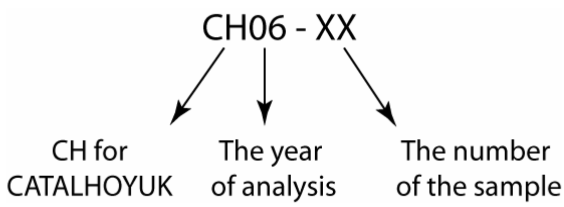
A. 2006 Samples

A total of 22 pottery sherds were submitted by the specialists for petrographical analysis by thin-section.

These sherds were choosen by ceramists in order to represent the different clay-based determined by the first classification.

Each samples has been nominated with a new label, from ch06-01 to ch06-22 (Figure 11).

Figure 11: 2006 SAMPLES



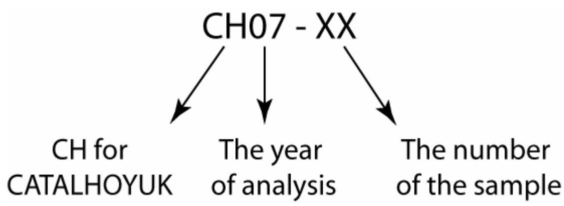
B. 2007 Samples

A total of 41 pottery sherds were submitted by the specialists for petrographical analysis by thin-section.

These sherds were choosen by ceramists in order to complete the study of the 2006 samples.

Each samples has been nominated with a new label, from ch07-01 to ch07-42 but the sample ch07-15 is a slag (Figure 12).

Figure 12: 2007 SAMPLES



2.3. Analysis methods

A variety of methods is availible for the petrographic study of archaeological ceramics. The most effective approach to the study of a serie of samples is to maximise the use of relatively rapid screening methods at an early stage and to use the information gained here to target selected samples for more detailed analysis where necessary [Doherty, 2006].

A. Binocular Microscope

This should be the first stage in the petrographic study of ancient ceramics.

The technique simply involves the low magnification examination of the surface of the sample. Magnification are typically between X10 and X40, the examination is non-destructive and any size of sample can be examided [Doherty, 2006].

Observation by binocular microscope gives the special relations of the different parts of the ceramic. It is possible to observe the succesion of operations on the surface of the object such as paints, slip[2] or glazes[3]. In cross-section, it gives information of the relations of temper grains and clay-rich zones of the paste or ceramic body. This is especially true if a sharp, polished cross-cut has been made on the sample [Velde, 1999].

Careful examinations of colour development by binocular microscope can recognise the firing variants and thereby reduce the number of apparent fabrics to a more realistic group [Doherty, 2006].

B. Polarized Light Microscope

Following the binocular microscope examination, the samples are prepared as thin-sections in order to be observed by polarized light microscope [Doherty, 2006].

The great advantage in using this microscope is the ability to identify the minerals according to their optical properties. The conditions to observe these properties are a polarization of the light. We distinguish:

- plane polarized light (PPL) when light beams from the source are selected which vibrate in only one direction;

- from the cross-polarized light (XPL) when a second polarizing material is placed in the light beam of rays that leave the sample. This polarizer can be rotated. When it is oriented so that the light beams vibrate at right angles to the first analyzer below the sample.

- and partly cross-polarized light (PXPL) when the second polarizing material is not perpendicular to the first polarizer.

Phase identification is very important for a distinction of different sources of materials, as well as identifying special characteristics which might be determinative of a specific ceramic production [Velde, 1999].

C. Scanning Electron Microscope (SEM)

For ceramic studies with SEM, samples are generally impregnated with resin and prepared as polished blocks. This microscope allows the sample to be investigated at much higher magnifications, i.e. in the range of X30-X5000 for routine work [Doherty, 2006].

The SEM uses the flux of secondary and backscattered electrons from the material to form an intensity image of the material bombarded by the electron beam. The resulting cathode tube realization indicates the three-dimensional aspect of the sample. This is very useful in the identification of textures and shapes of mineral grain aggregates [Velde, 1999].

The SEM is therefore a powerful technique which can readily applied to a wide range of problems in ceramic petrology [Doherty, 2006]. Some examples of these include:

- the bulk chemistry of a clay;
- the identification of mineral inclusions;
- the chemical composition of the slips...

[2] *Slip* : a layer of very fine clay applied to the body to give a smoother and/or a different coloured appearance.

[3] *Glaze* : a shiny decorative layer made by applying a mixture of ingredients which are specially formulated to melt to a glassy material at relatively low temperatures.

3. Results & Discussion

3.1. The different inclusions

The two main types of inclusions in the ceramic sherds at Çatalhöyük are: the volcanic inclusions and the sedimentary inclusions. We can distinguish sherds with a majority of volcanic inclusions, or a majority of sedimentary inclusions, but in most of the sherds, volcanics and sedimentaries are in equal mixed proportion.

Some sherds present characteristic inclusions such as organic matter, or metamorphic minerals.

Examples of which minerals could have been observed during the petrographic study are listed below (Figure 13).

VOLCANIC	SEDIMENTARY	METAMORPHIC	OTHERS
Quartz	Quartz (sandstones)	Quartz (polycristallised, ondulous extinction)	Organic Matter
Feldspars	Feldspars (sandstones)	Garnet (schists)	Bones
Amphibole	Chert Radiolarite	Fibreous Amphibole	
Mica (muscovite, biotite)	Calcite	Talc	
Pyroxene Clinopyroxene	Clay pellets	Epidotes	
Pumice	Gypsium	Glaucophane	
Volcanic Glass			

Figure 13: mains inclusions observed in the sherds.

A. Volcanic Inclusions

Concerning the volcanic inclusions we can recognize, some dacitic and andesitic groundmass (as ch06-18, ch07-31, ...).

From time to time pumice (as in ch06-15, ch07-18,...), weathered basalt (as in ch06-22, ch06-21,...) and devitrification (as in ch06-06, ch07-01, ch07-03, ch06-22, ch07-35,...) can be seen.

In ch07-35 and ch07-34 some plagioclases with a sieve texture has been observed. Volcanic glass is present in various amounts but it is conspicious in ch06-13, ch06-15, ch06-20, or ch07-23 for example (Figure 14).

Or course all the classical volcanic inclusions such as quartz, pyroxenes, plagioclases, amphiboles and micas, are also presented.

B. Sedimentary Inclusions

With the sedimentary inclusions and particularly with the calcite it is possible to show up the heating influence on minerals. By heating calcite, CaO and CO2 are formed. As CO2 is removed, CaO takes a micro-cristalline structure. With the cooling, CaO cristallises again in CaCO3, but it keeps its micro-critalline structure. As we can see on the Figure 15, heated calcite presents no structure and has a dark-brown colour.

In the samples, calcite and heated calcite are found, but sparitic and micritic inclusions from limestones are more conspicuous.

Another type of inclusions well-represented are cherts, it is present as reddish chert (iron-rich chert), fine-grained chert and radiolarite (Figure 15).

Some gysium has been found in ch07-04 and ch07-20 and some shells are variously represented in ch06-01, ch06-07, ch06-16, ch07-04 or ch07-12 for example.

Several opaques can be observed in the matrix on PPL, but they are quite complicated to identify. However, we could supposed that some of them are iron oxides or iron-rich clay

C. Tectonic Inclusions

The tectonic/metamorphic inclusions are just present in some particular sherds. For instance, phyllite, talc and fibrous amphibole have been observed mainly in the sherds ch06-04, ch06-19, ch06-14, ch06-05, ch06-17 ch07-38 and ch07-40 (Figure 16).

The glaucophane is quite complicated to be seen because of its small size and when it is present, it is in very small amount.

Garnets are not common and have been observed only in ch06-18 and ch07-29.

Epidotes have been found in several samples, as ch06-02, ch07-01, ch07-12, ch07-18 for example.

D. Organic Inclusions

The oxidation of the carbon begins at 200℃ or above and it is not completely eliminated until 600℃. Generaly, only the phantom of the organic matter can be observed.

Moreover, most of the time organics have been added by the potter in order to improve the coherence of the clay.

At Çatalhöyük, a small amount of sherds are low-fired and in that case organic matter can still be observed (Figure 17).

Differents types of organic matter have been distinguished such as organic pellets (ch07-30), and stem plant (ch06-21).

The samples which content some organic matter or some of their phantoms are ch06-05, ch06-21, ch07-12, ch07-20, ch07-30 and ch07-34.

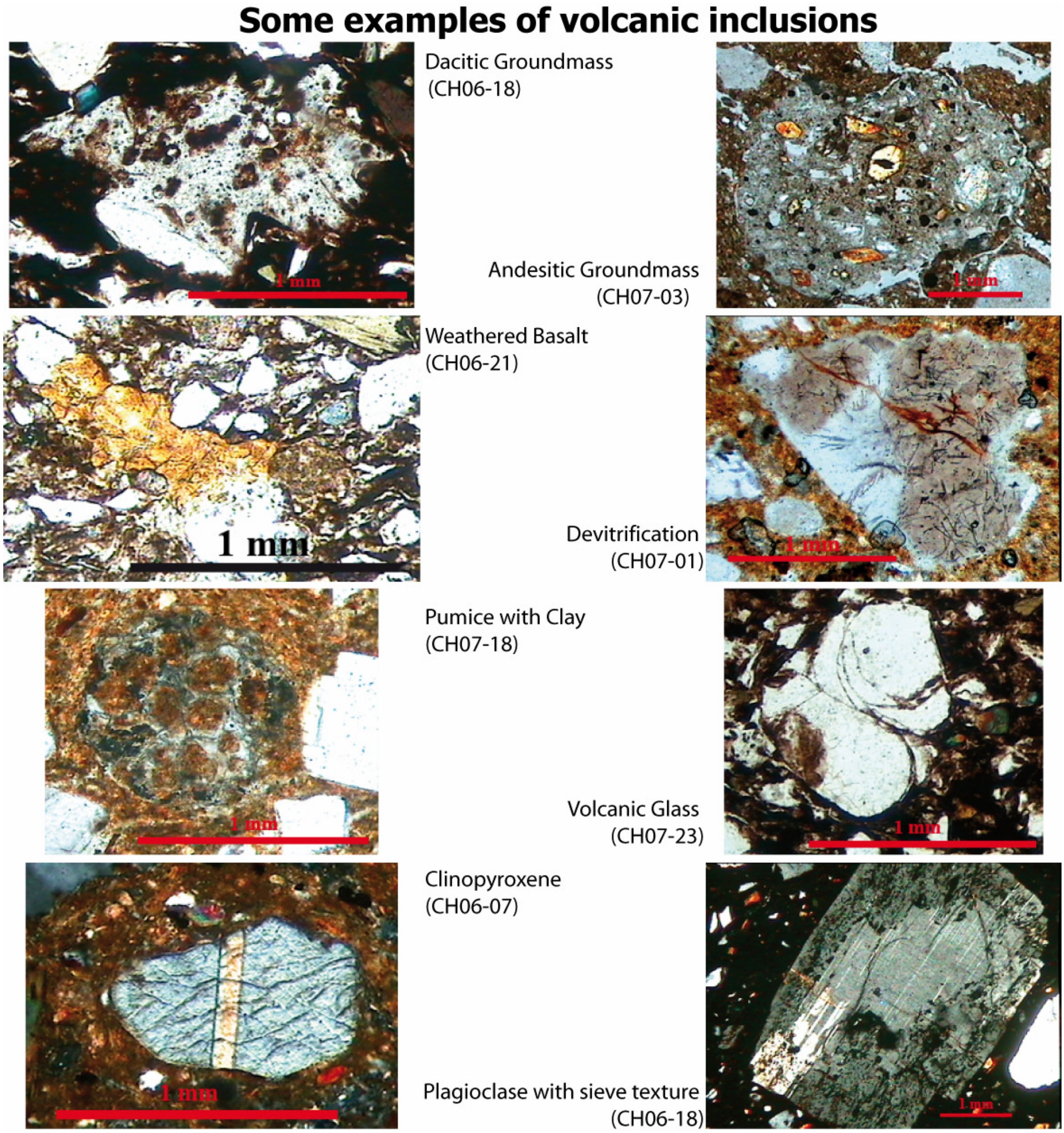


Figure 14: Some examples of specific volcanic inclusions.

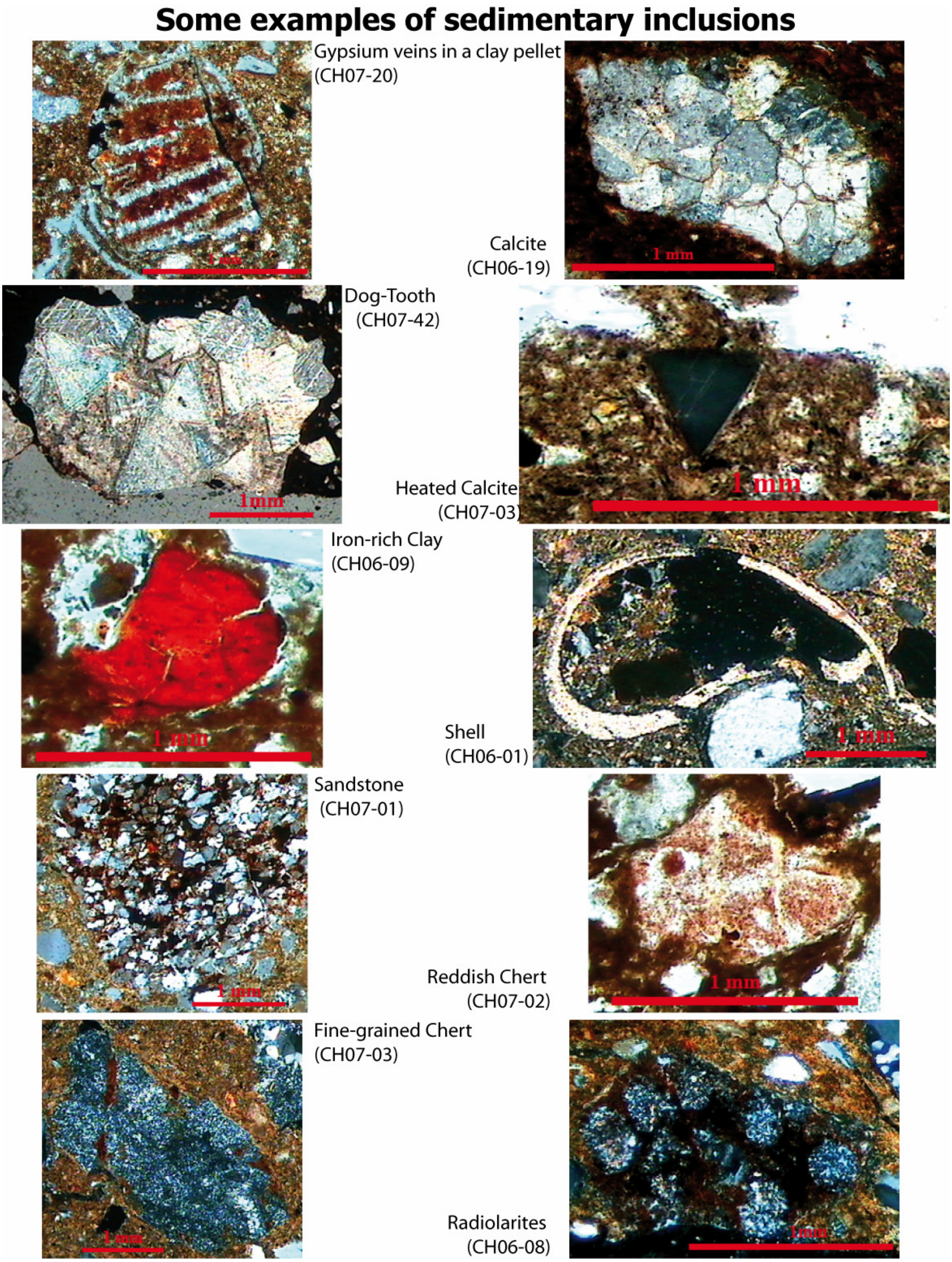


Figure 15: Examples of sedimentary inclusions.

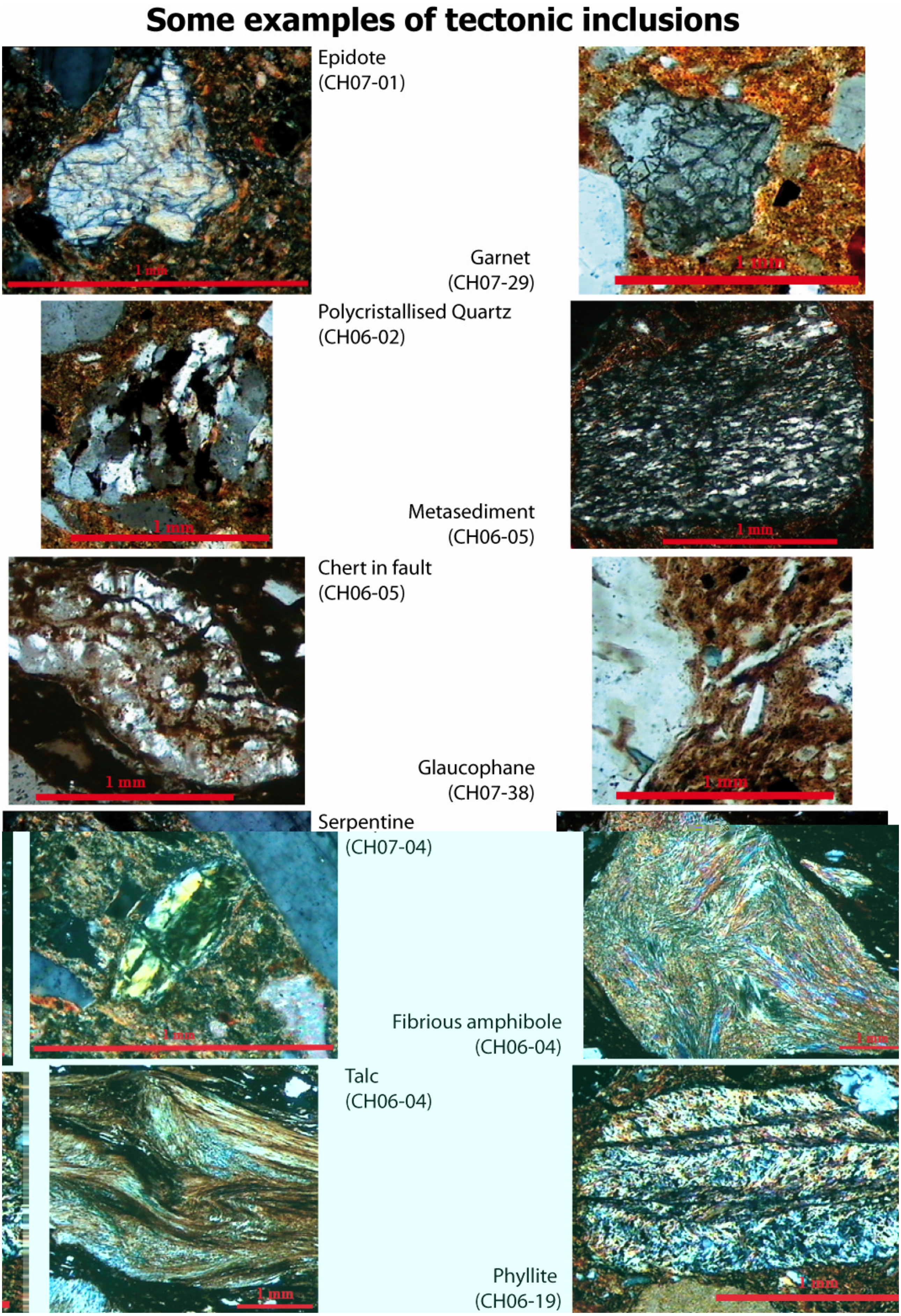


Figure 16: some exaples of tectonic inclusions.

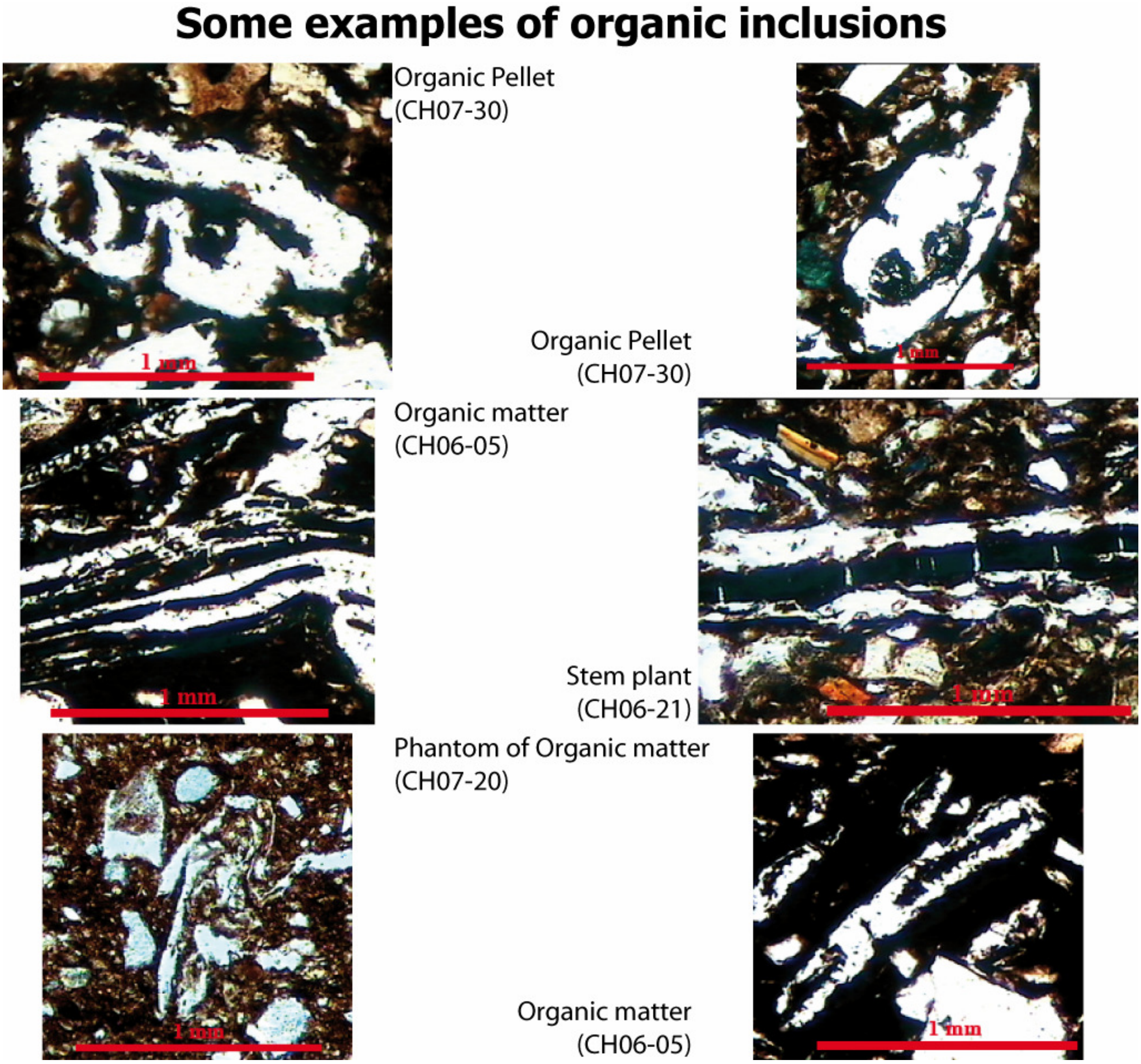


Figure 17: Some examples of organic inclusions.

3.2. The different Body – First impressions

After the binocular and the petrographic work it is obvious that some hypothesis have been made concerning the kind of clay. Even if these observations have to be confirmed by a characterisation study with SEM analysis, the first feelings are presented here.

First of all, the majority of the samples seem to have a body made of a calcareous-ferrugineous clay. Only three samples (CH07-33, CH07-36 and CH07-08) seem to contain a calcareous-rich clay, which give a particular aspect to the thin-section (Figure 18).

Two samples present a very typical red clay which are CH06-17 and CH07-40.

An amount of sample present a dark clay but the chemical analysis will provide more informations. It could indeed be due to a low firing, an high content in organic matter, some reduced conditions, a lack of calcareous components...

One important last point is the fact that some sherds present a very high inclusions content which give the impression that the fabric is almost grain-supported (Figure 18).

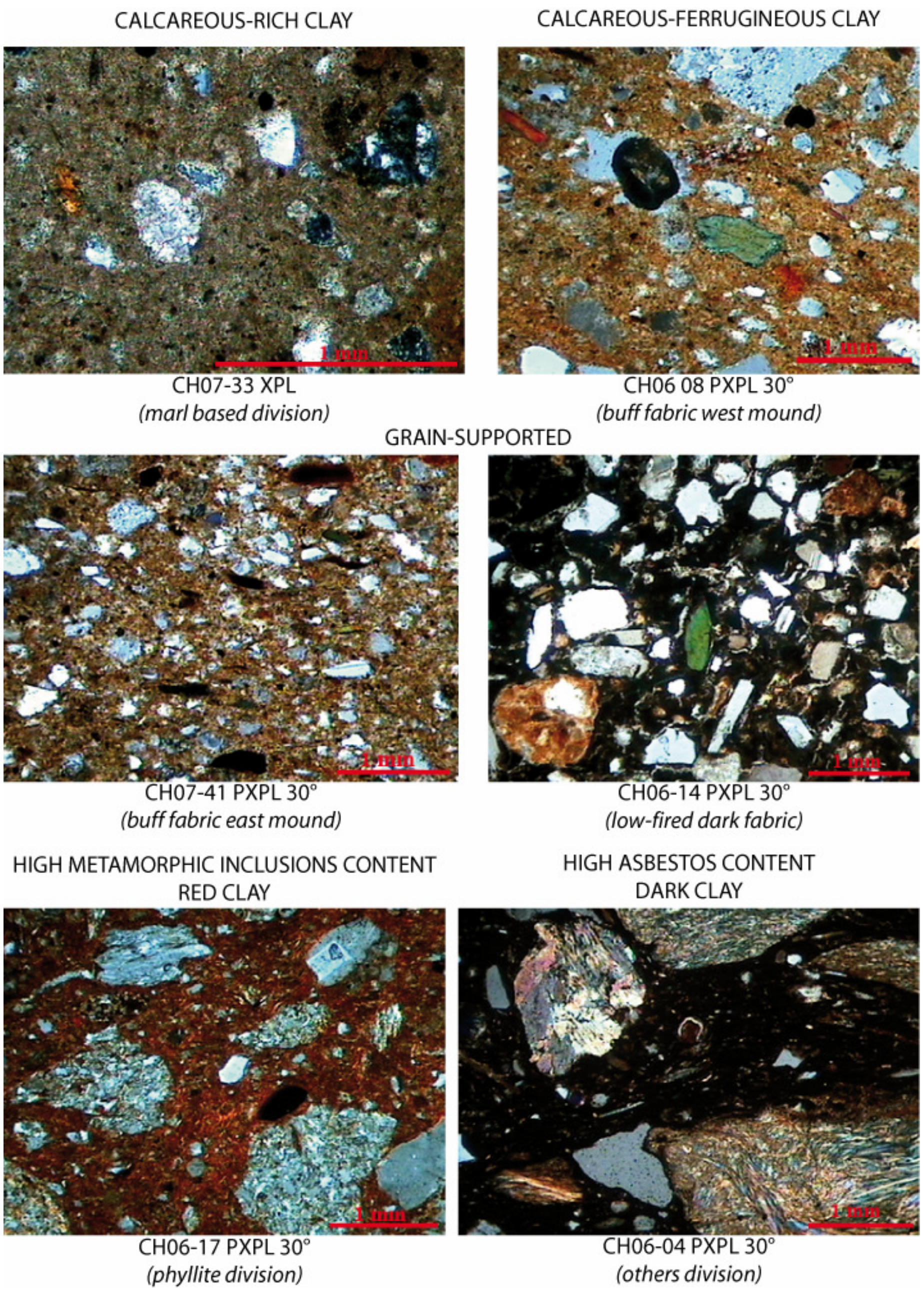


Figure 18: Examples of the different types of bodies found in the Çatalhöyük samples.

3.3. First geological classification

After the binocular and the microscope obervations, the first conclusion concerning the samples is that two main groups can be distinguished. The samples including local and natural inclusions and the samples including non-local/tempered inclusions (called the "Exotic" group). It is obvious that most of the samples have been made with a local clay as 53 samples in the 63 in total contain typical inlusions of the Konya Region (Figure 19). The May river contributes with mainly volcanic inclusions when the Çarşamba contributes with sedimentary and tectonic inclusions. These inclusions naturally occur in different proportions in the sherds. There are samples with predominent volcanic inclusions, and samples with volcanic or sedimentary inclusions in equal proportion. Sample with predominent sedimentary inclusions are not so common because of the strong influnce of the May river which carries volcanics. Each division (in blue, in Figure 19) will be presented more precisely below, this is the most important point in order to understand the provenance.

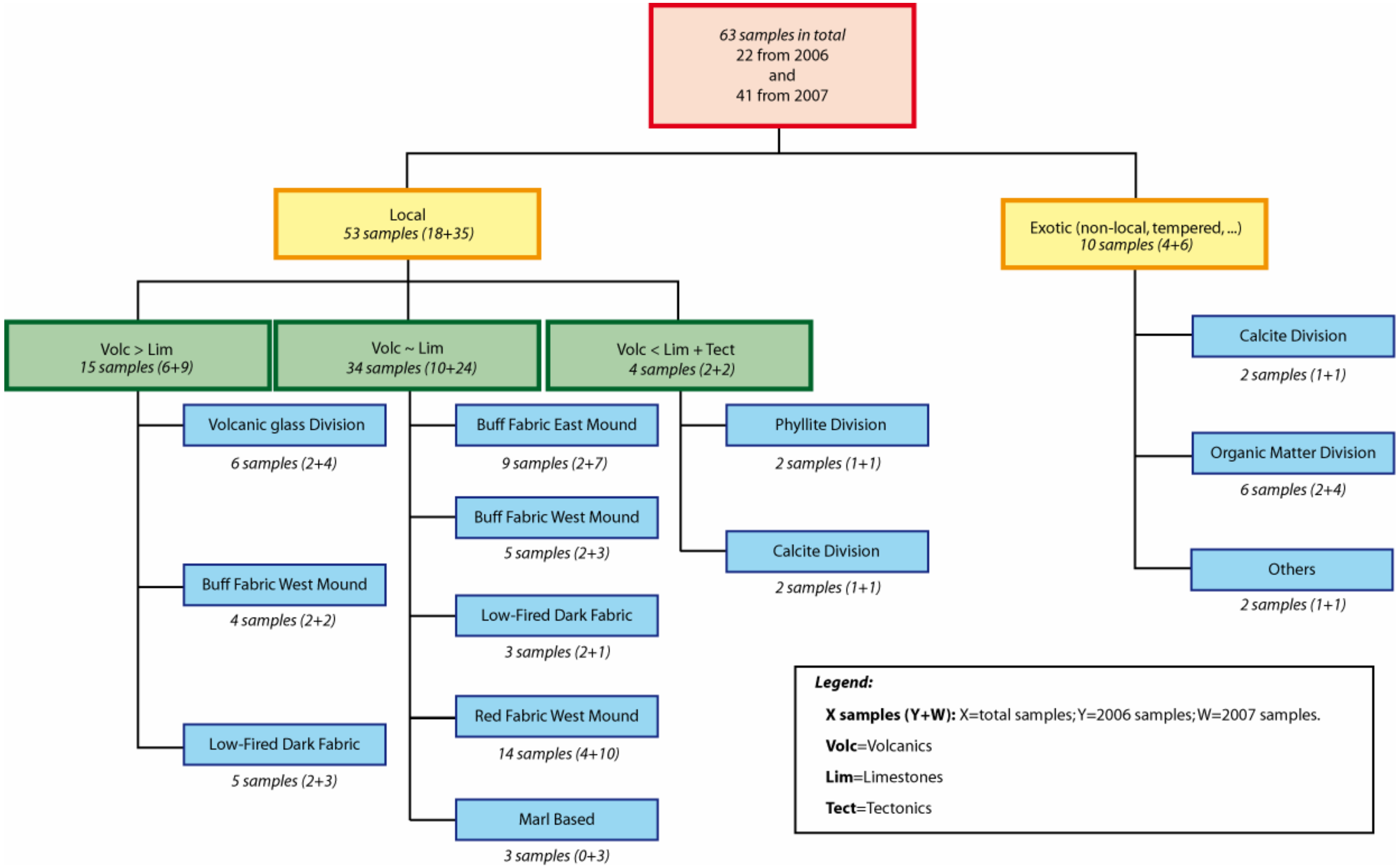


Figure 19: Flow sheet: Repartion of the samples after a first classification according to the mineralogical inclusions.

A. Samples containing specific inclusions

Six groups containing specific inclusions have been differenciated, they are:

- calcite division
- phyllite division
- organic matter division and,
- volcanic glass content.

All the photographs of the thin-sections are presented by group *in Appendix 2*.

- *Calcite Division*

This group contains four samples, two from 2006 – ch06-03, ch06-19 – and two from 2007 – ch07-38 and ch07-42.

Even in one division there is always a possibility to find some sub-group, each sample has his own particularities. However it has been choosen not to differenciate to much the sherds but to keep the main particularity in order to characterize them.

That is why in the calcite division, ch06-03 contains mainly coarse inclusions of micritic and sparitic limestones (Figure 20) when ch06-19 and ch07-38 contains also some tectonised inclusions such as talc (Figure 21).

Ch07-42 is quite particular because in this sample, the calcite has a typical shape. It seems to be a sparitic limestone inter-bedded with clay (Figure 22).

Figure 20: On the left, micritic and sparitic intraclastes, in CH06-03 on microscope (PXPL, 30°).

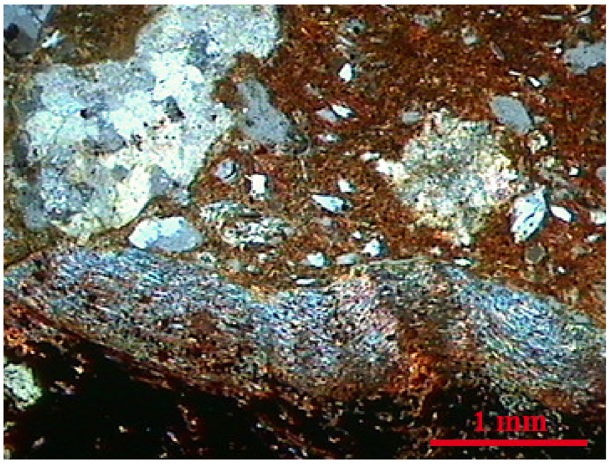


Figure 21: On the right, sparitic intraclaste with talc below, in CH06-19 on microscope (PXPL, 30°).

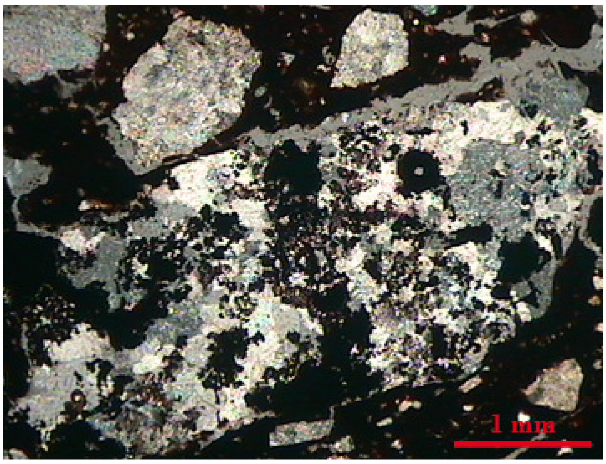


Figure 22: Sparictic intraclaste with clay in CH07-42, on microscope (PXPL, 30°).

- *Phyllite Division*

This division contains only two samples – ch06-17 and ch07-40 – but very specific. They contain not a lot or no volcanic and sedimentary inclusions but metamorphic inclusions such as phyllite, polycristallised quartz or metasediments. Even the clay is different and gives to the samples a particular red colour easy to identify (Figure 23).

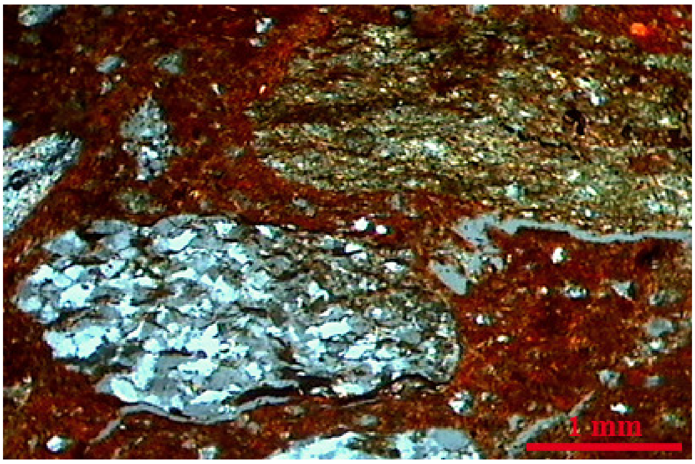
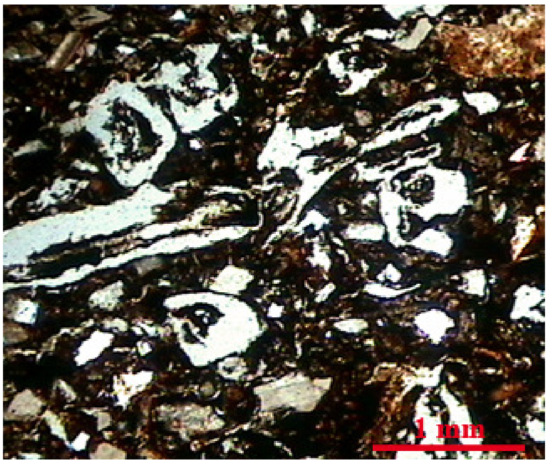


Figure 23: Metamorphic inclusions (phyllite and talc), in CH07-40 on microscope (PXPL, 30°).

- *Organic Matter Division*

This group contains two 2006 samples (ch06-05, ch06-21) and four 2007 samples (ch07-12, ch07-20, ch07-30, ch07-34). This division is characterised by a dark-brown clay with fine-grained inclusions. When the ceramic is low-fired, the organic matter is easily observed by eyes (Figure 24) otherwise some phantom of organic matter can be observed with a microscope (Figure 25).

Figure 24: On the left, plant stem and organic pellets in CH07-30 on microscope (PXPL, 30°).



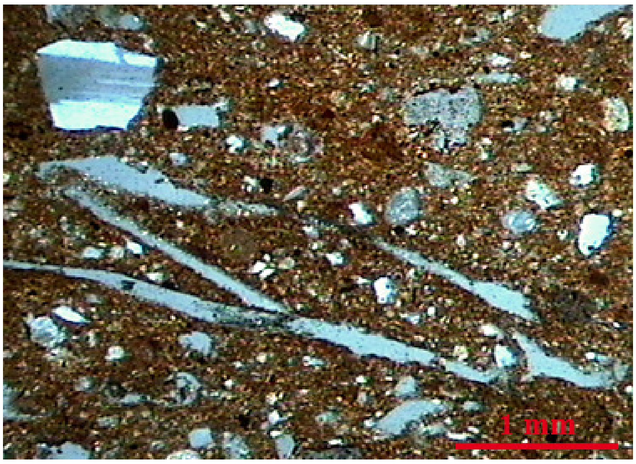


Figure 25: On the right, phantom of organic matter in CH07-20 on microscope (PXPL, 30°). ***Notice the difference of colour with the clay still containing organic matter.***

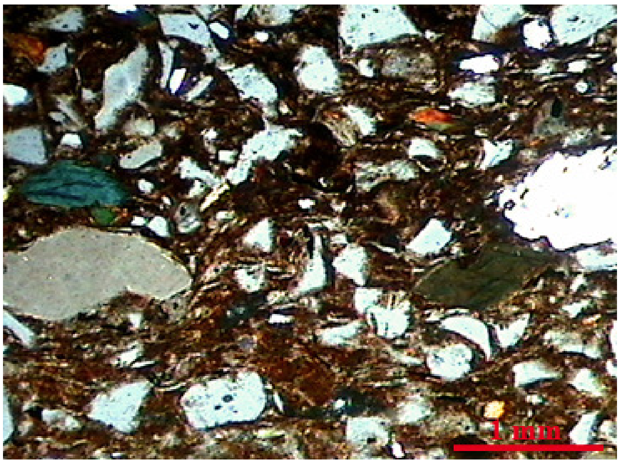
- *Volcanic Glass content*

The volcanic glass is one of the most difficult inclusions to remark. It is only when you are actually looking for it than you can notice it. The samples of Çatalhöyük do not contain a lot of volcanic glass but six of them have got a sufficient amount in order to create an independent division. Their occurence is very informative concerning the provenance.

Ch06-15 is the sample with the most important amount of volcanic glass (Figure 26), then followed ch07-31, ch07-32, ch06-13, ch07-24 and ch07-27 with the less amount of volcanic glass.

These samples are quite rich in volcanic inclusions such as amphiboles, andesite and dacite (Figure 27)

Figure 26: On the left, matrix of the sample CH06-15 on microscope (PXPL, 30°).
Volcanic glass can easily be recognised because of its angular shape.



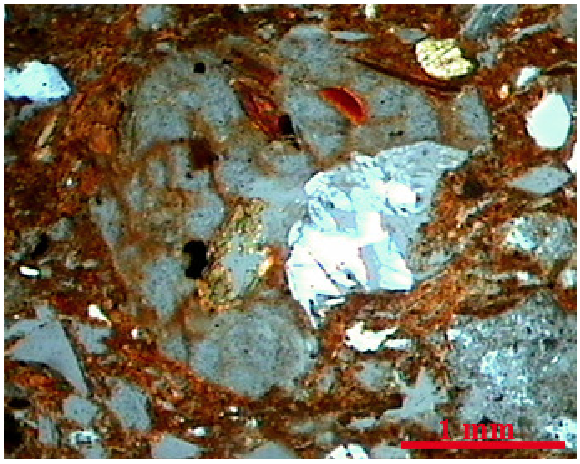
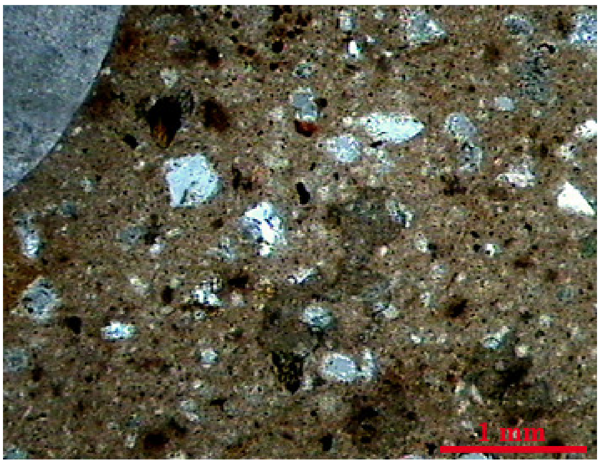


Figure 27: On the right, dacite in CH07-27 on microscope (PXPL, 30°).

- *Marl Based*

This division contains only three 2007 samples which are ch07-08, ch07-33 and ch07-36. Nevertheless the body of these samples is characteristic of a calcareous-rich clay (Figure 28) with a content of fine-grained volcanics as well as some cherts and limestones (Figure 29).

Figure 28: On the left, the characteristic body of calcareous-rich clay of the sample CH07-33 on microscope (PXPL, 30°).



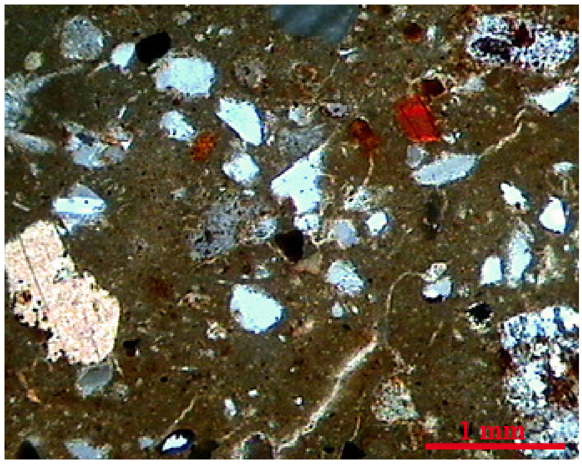


Figure 29: On the right, again calcareous-rich clay and some volcanics in CH07-36 on microscope (PXPL, 30°).

- *Others*

This division contains two samples which are divided into one from 2006 (ch06-04) and one from 2007 (ch07-29).

The sample ch06-04 is very typical and unique, it is the only sample with such a content of metamorphic inclusions such as fibreous amphiboles (Figure 30). The matrix is dark and very fine-grained, but the inclusions are coarse and mainly asbestos.

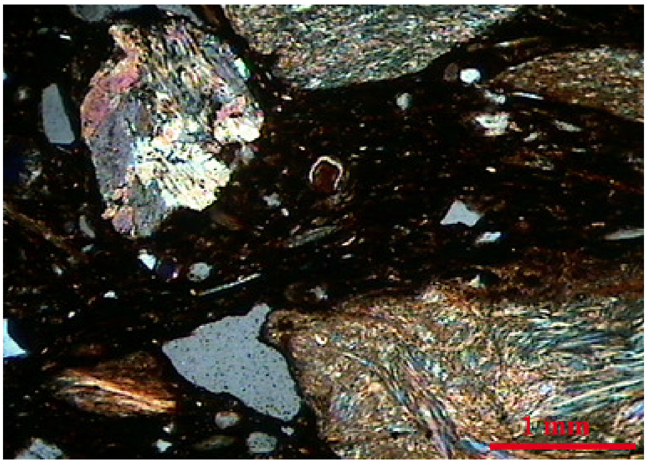


Figure 30: CH06-04, a unique sample with such metamorphic inclusions, on microscope (PXPL, 30°).

As for ch07-29, the matrix is made of a very fine-grained silt and the inclusions are mainly volcanics (Figure 31). The particularity of this samples is the occurrence of some tectonic inclusions such as epidotes and garnet.

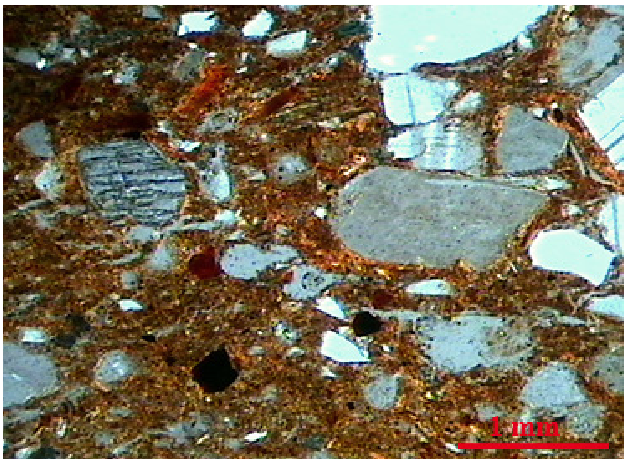


Figure 31: The sample CH07-29 contains mainly volcanic inclusions, on microscope (PXPL, 30°).

B. Samples containing volcanic-sedimentary (May-Carsamba) inclusions

However, most of the Çatalhöyük samples are very fine-grained and it is quite complicated to differenciate the main contribution as the inclusions consists on a mix of volcanic and sedimentary inclusions. That is why a classification according to the colour and the localisation on the site has been done, even if we had tried to specify the type of inclusions.
We can recognise 4 groups :

- Red fabric west mound
- Buff fabric east mound
- Buff fabric west mound and,
- Low-fired dark fabric.

- *Red Fabric West Mound*

The red fabric is the most important division, it contains fourteen samples, four from 2006 and ten from 2007 (Table 1).

	Fine inclusions	Bimodale distribution	Coarse inclusions
2006 Samples	CH06-09	CH06-11	CH06-07, CH06-10
2007 Samples	CH07-02, CH07-06, CH07-13, CH07-14, CH07-16	CH07-09, CH07-17, CH07-19	CH07-05, CH07-11

Table 1 : Organisation of the « Red Fabric West Mound » samples according to the size of the inclusions.

Most of the red fabric samples are fine-grained and it is consequentely more complicated to reorganise this group. The greater part of them contains a mixed of volcanic-sedimentary inclusions (May- Çarşamba rivers) (Figure 32).

CH06-11, CH07-09, CH07-17, CH07-19 present a bimodale distribution of the inclusions which means these samples contain fine-grained volcanics (amphiboles, ...) and coarser sedimentary or volcanic inclusions (such as cherts, or igneous groundmass).

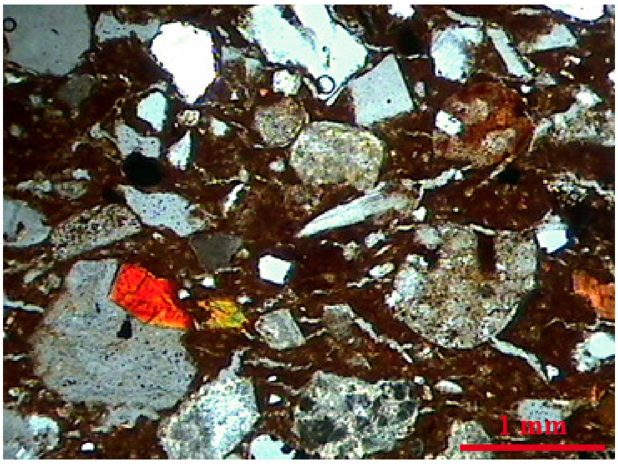


Figure 32: Organisation of the matrix and the inclusions (amphibole, dacite, micritic intraclastes,...), in CH07-02 on microscope (PXPL, 30°).

- *Buff Fabric East Mound*

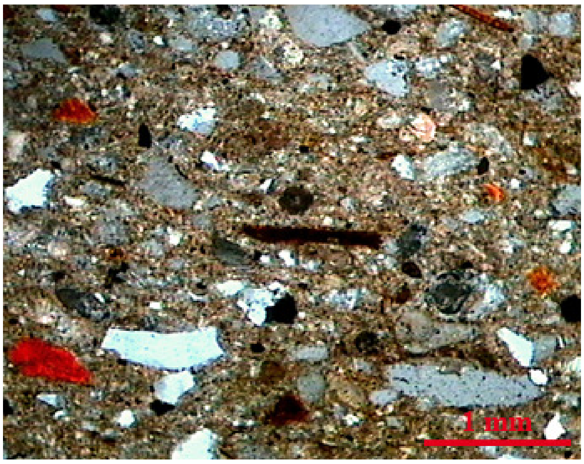
This division contains nine samples which are divided into two from 2006 and seven from 2007 (Table 2).

	Fine inclusions	Bimodale distribution	Coarse inclusions
2006 Samples	CH06-12, CH06-16		
2007 Samples	CH07-28, CH07-39, CH07-41	CH07-25	CH07-37CH07-21, CH07-22,

Table 2 : Organisation of the « Buff Fabric East Mound » samples according to the size of the inclusions.

Some samples are fine-grained (Figure 33, and Figure 34) and some others are coarser (Figure 35, and Figure 36), but again it would have been too precised to create one group for each sample. They come from the same mound, by eyes they look quite similar and moreover the nature of the inclusions seems identical. This division is characterised by a calcareous-ferruginous rich clay body with a mix of volcanic and sedimentary inclusions. That is why the decision to regroup these samples has been taken.

Figure 33: On the left, matrix of the sample CH06-12 included fine-grained volcanic inclusions (amphiboles,...) on microscope (PXPL, 30°).



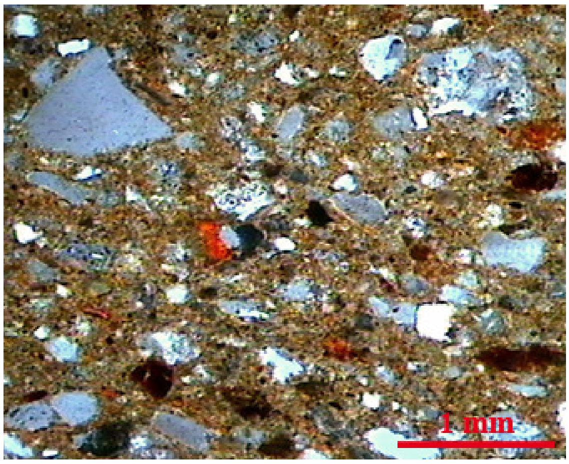
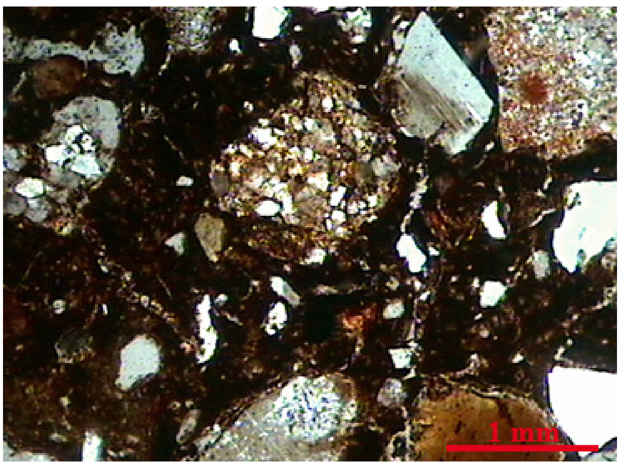


Figure 34: On the right, fine-grained sample (CH06-16) of volcanic and sedimentary inclusions, on microscope (PXPL, 30°).

Figure 35: On the left, coarse mainly sedimentary inclusions in CH07-21 on microscope (PXPL, 30°).



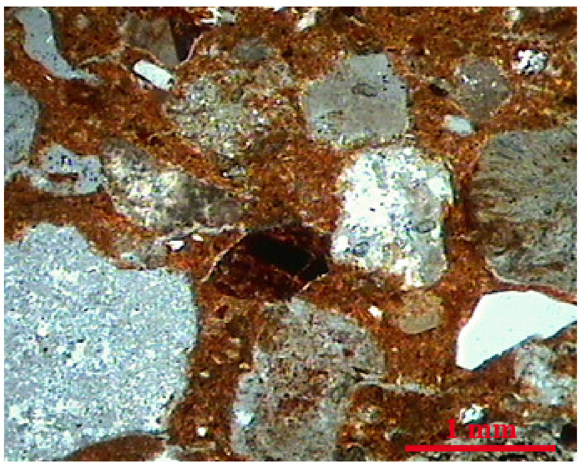


Figure 36: On the right, coarse volcanic and sedimentary inclusions in CH07-22 on microscope (PXPL, 30°).

- *Buff Fabric West Mound*

This division contains nine samples which are divided into four from 2006 and five from 2007 (Table 3).

	Fine inclusions (Volcanic~Limestone)	Volcanic>Limestone
2006 Samples	CH06-08, CH06-02	CH06-01, CH06-06
2007 Samples	CH07-01, CH07-04, CH07-18	CH07-10, CH07-03

Table 3 : Organisation of the « Buff Fabric West Mound » samples.

Some buff fabric west mound samples seem to contain a higher percentage of volcanic inclusions (CH06-01, CH06-06, CH07-10, CH07-03). However, they present a similar body: a calcareous-ferrugineous clay. Concerning the inclusions, the volcanics are mainly fine-grained (Figure 37, and Figure 39) but from time to time, coarse igneous groundmass can be observed (Figure 38). The content in sedimentrary inclusions and their size fluctuate according to the sample. Tectonic inclusions are scarse but there are some occurence in ch07-03 for example (Figure 40).

Figure 37: On the left, fine-grained volcanic inclusions in the sample CH06-01, almost grain-supported, on microscope (PXPL, 30°).

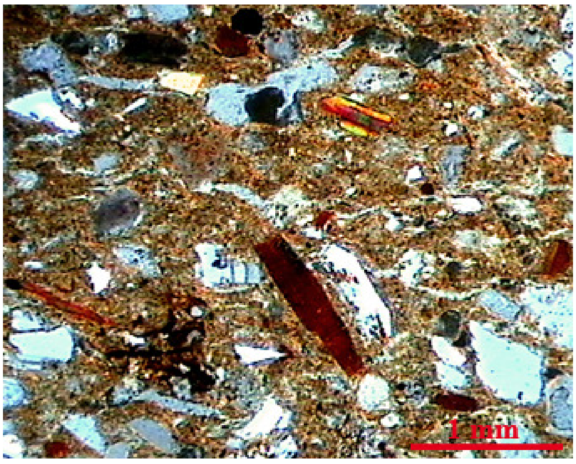
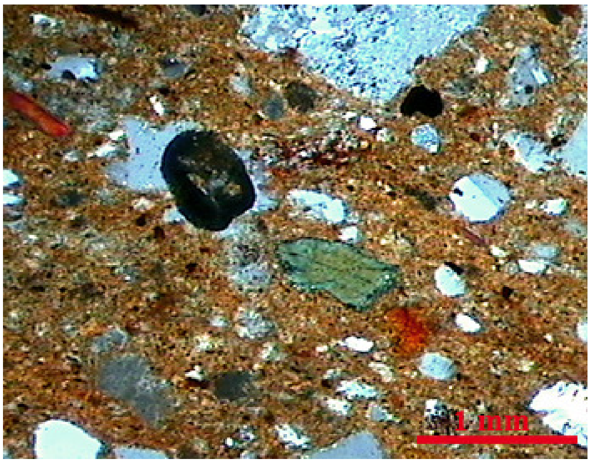


Figure 38: On the right, coarse volcanic inclusions (dacite, clinopyroxene,...) in CH06-06 on microscope (PXPL, 30°).

Figure 39: On the left, fine-grained volcanic and sedimentary inclusions in the sample CH06-08 on microscope (PXPL, 30°).



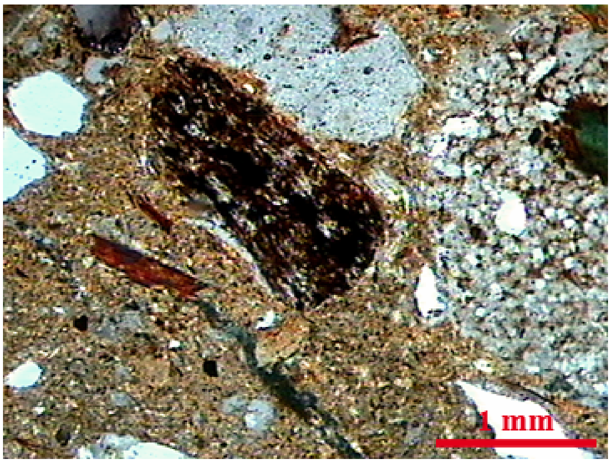


Figure 40: On the right, coarse volcanic inclusions in CH07-03 on microscope (PXPL, 30°).

- *Low-fired Dark Fabric*

This division contains eight samples which are divided into four from 2006 and four from 2007 (Table 4).

	Volcanic>Limestone	Fine inclusions (Volcanic~Limestone)
2006 Samples	CH06-18, CH06-20	CH06-14, CH06-22
2007 Samples	CH07-26, CH07-23, CH07-35	CH07-07

Table 4 : Organisation of the « Low-fired Dark Fabric » samples.

Most of the samples contain more volcanics than sedimentary inclusions. The Low-fired dark samples have been regrouped because of their body which consists in a dark clayey silt (Figure 42, and Figure 44). It was supposed that this specific colour was due to a low or quick firing. Some sample such as ch06-14, ch06-22 or ch07-07 present a very high inclusions content (Figure 41, and Figure 43).

Figure 41: On the left, aspect of a grain-support sample (CH06-14) with volcanic and sedimentary inclusions on microscope (PXPL, 30°).

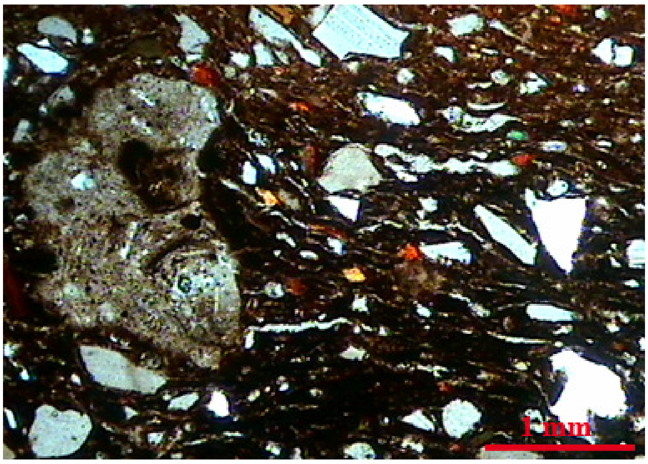
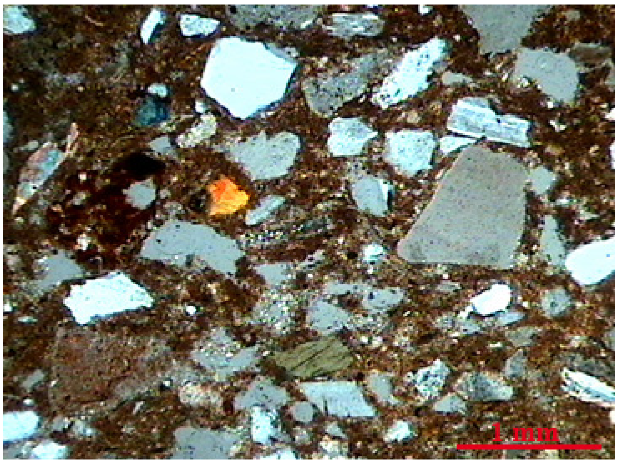


Figure 42: On the right, bimodale distribution of the inclusions in CH06-20 (the coarser one is a dacitic groundmass) on microscope (PXPL, 30°).

Figure 43: On the left, angular volcanic and sedimentary inclusions of the sample CH07-07 on microscope (PXPL, 30°).



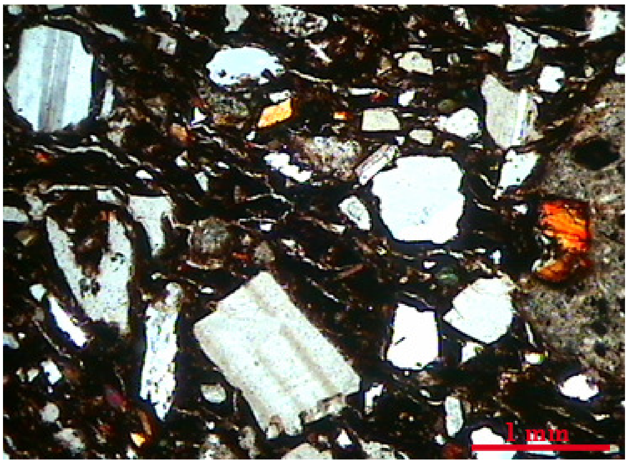


Figure 44: On the right, mainly volcanic inclusions in CH07-35, the shrinkage of the clay can be observed on microscope (PXPL, 30°).

3.4. Firing Experiment
A. Objectives and proccess

It is of course necessary to specify this four last groups, but as chemical analysis were impossible to realise, a firing experiment had been performed.

The colour of a ceramic can be a consequence of:

- the nature of the inclusions,
- the nature of the clay
- the condition of firing (temperature, oxidised conditions...)

The aim of this experiment was to try to understand the influence of firing on the Çatalhöyük ceramics. In total, 20 samples have been picked out and cut in equal piece of 2 cm wide (Table 5).

Red Fabric West Mound	Buff Fabric East Mound	Buff Fabric West Mound	Low-fired Dark Fabric
CH06-09, CH06-11, CH07-02, CH07-05, CH07-06, CH07-11	CH06-12, CH07-28, CH07-39	CH06-01, CH06-06, CH06-08, CH07-01, CH07-03, CH07-04	CH06-18, CH06-20, CH06-22, CH07-23, CH07-35

Table 5: Arrangement of the Çatalhöyük samples selected for the experiment.

These samples have been choosen as far as possible in order to represent each division however some sherds where too small and were impossible to cut. That is why for example, only three samples of the division "Buff Fabric East Mound" have been selected.

Then all the samples have been put in a furnace (Figure 45) and fired at 500°C during one hour. At the end of the firing a photograph of each section has been made. The same proccess has been applied at 600°C, 700°C, 800°C, 900°C and finally 1000°C.

Figure 45 : Çatalhöyük sections in the furnace after a firing.

B. Results and interpretation

After the end of each firing, each sample has been photographied. The complete results are available in *Appendix 3*. But for convenient reasons, only the photograph before the beginning and after the end of the experiment are showed (Figure 46, and Figure 47).

The first major observations of this experiment is that after the sequence of firing, all the samples showed a homogeneous colour varying between orange to dark red according to the sample:

- All the buff fabric east mound samples present an orange colour as one sample of the buff fabric west mound (ch06-08) and three samples of the red fabric west mound (ch07-06, ch07-05-ch06-09).
- All the low-fired dark fabric present a dark red colour as two samples of the buff fabric west mound (ch06-06 and ch07-03).
- All the other samples showed a red colour.

Usually, researchers consider that the first evidence of pottery have been fired between 500-800℃. The oxidation of the carbon begins at 200℃ or above this temperature and this is not completely eliminated until 600℃. At this latter temperature, others impurities and inclusions are also volatilized. All these modifications have an impact on the colour of the sherd.

In this experiment, concerning the impact of the temperature on the ceramic colour, we noticed:

- After the firing at 800℃, ALL the samples have a homogeneous colour, we can supposed that all this prehistoric samples have been fired below 800℃;
- After the first firing (at 500℃), no one of the samples of the “low-fired dark fabric” is dark anymore! Consequently, these ceramics have been fired below 500℃ or at 500℃ but with a shorter firing time.

It is obvious that the conditions of this experiment (constant temperature, constant time,...) are not the same that in prehistoric times. That is why it is quite complicated to estimate precisely the temperature.

However, we can remember that:

- The “low-fired dark fabric” are actually low-fired and that their colours after the last firing are quite closed from some samples of the buff fabric west mound;
- The buff fabric east mound samples present a colour closed to some samples of red fabric west mound...

It must not be forgottent that these remarks are purely subjective and by no means these hypothesis have to be understood as facts. They are only reasoning ways and chemical analysis have to be performed in order to characterise precisely the clay and the different inclusions.

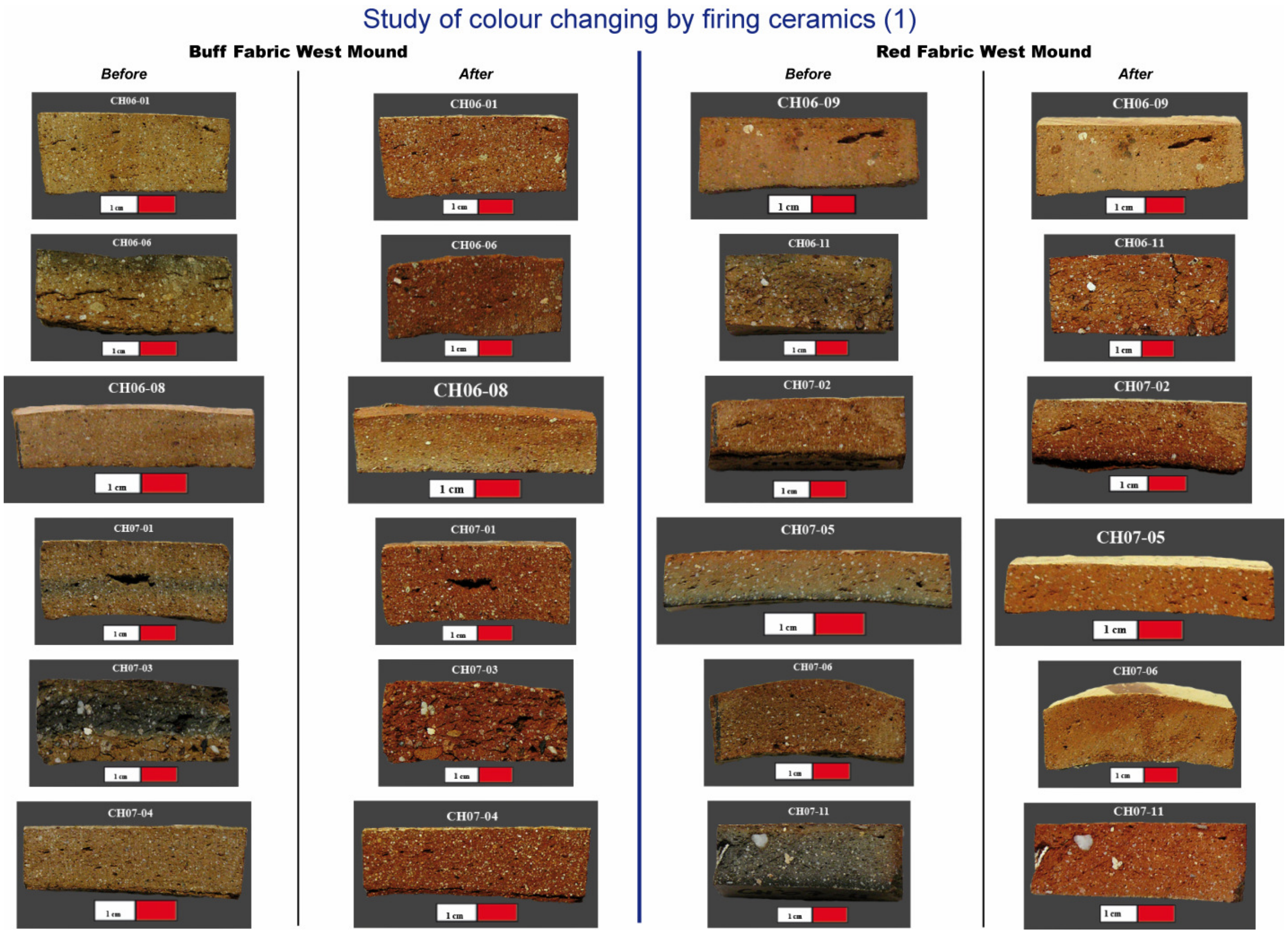


Figure 46: Comparison between the colour before and after the experiment for the Buff Fabric West Mound and for the Red Fabric West Mound samples.

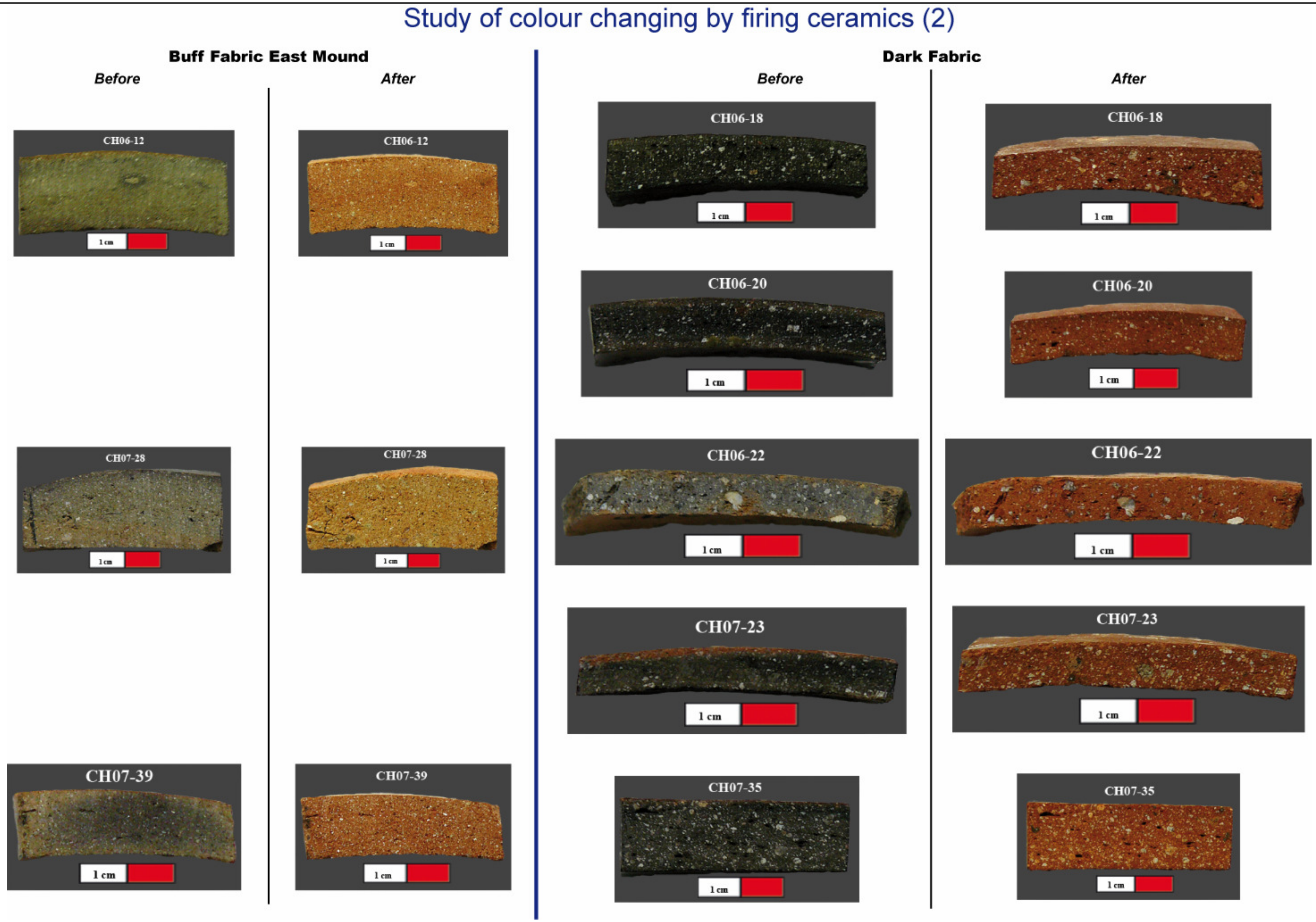


Figure 47 : Comparison between the colour before and after the experiment for the Buff Fabric East Mound and for the Low-Fired Dark Fabric samples.

3.5. First conclusions concerning the provenance

Now the composition of the Çatalhöyük samples is well-known, some ideas concerning the provenance emerge.

There are four main possibilities concerning the possible provenance of the clay which are:

- The Upper May river;
- The Upper Çarşamba river;
- The Basin sediments, particularly with the Çarşamba-May Fan, and
- Some “exotic”(non-local) areas.

A. Upper May

Some reminders have to be given concerning the May River which runs into volcanic areas on the South-West of the Konya Basin.

Volcanic rocks from this area are characterised by high degrees of differenciation with large andesitic and dacitic lava domes, nuées ardentes, and ignimbrite deposits [Temel et al., 1998]. A petrological and geochemical characterisation of these volcanic rocks has been perfomed by Temel et al. in 1998. Thanks to this study, it is possible to precise in which rocks the May river runs. They consist mainly of :

- Lava domes from Alacadağ
- Kuzağil and Erenkaya Ignimbrites, and
- Nuées ardentes from Alacadağ (Figure 48).

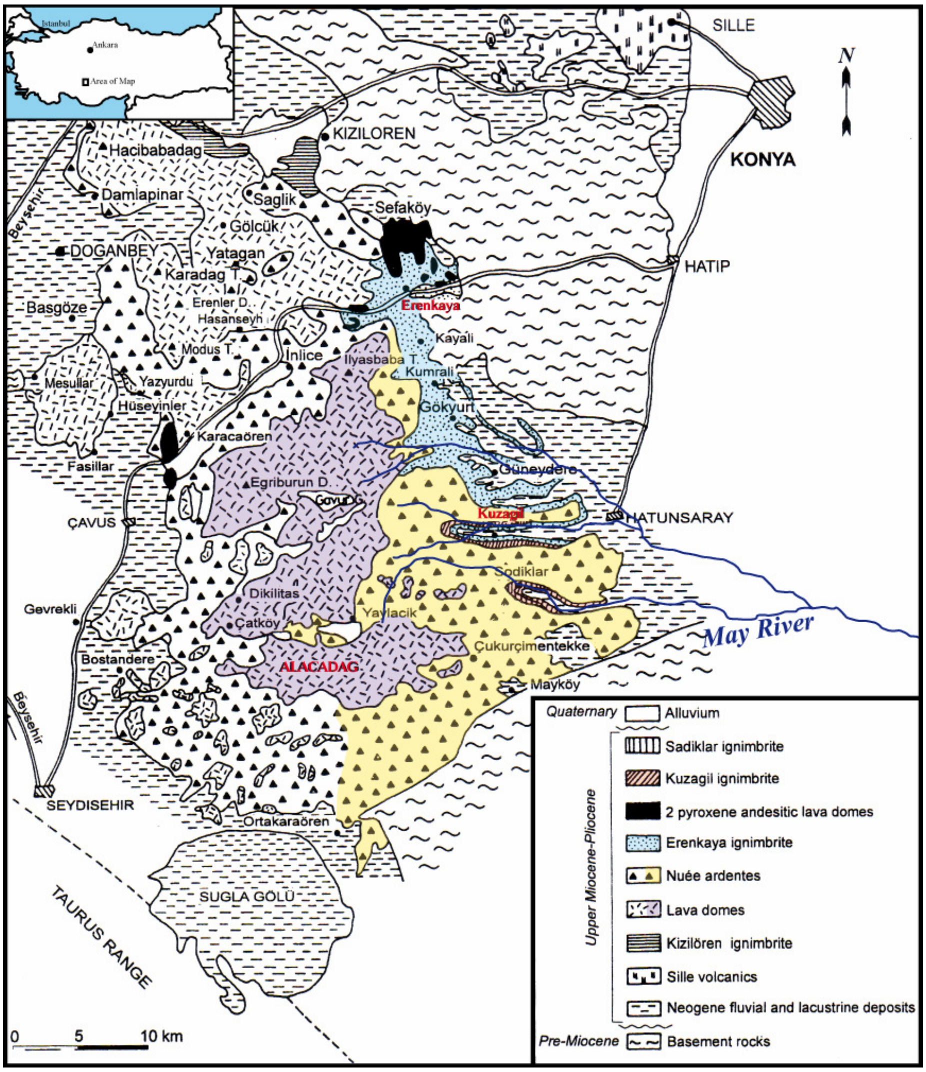


Figure 48: Localisation and details concerning the volcanic area [from Temel et al., 1998]

Phenocrysts assemblages of Konya volcanics exhibit plagioclase, augite, orthopyropyroxene, varous calcic amphiboles, biotite, phlogopite, oxides and less common quartz and olivine [Temel et al., 1998] (Table 6).

Lava domes Erenlerdağ/Alacadağ	Kuzağil and Erenkaya Ignimbrites	Nuées ardentes Erenlerdağ/Alacadağ
- plagioclases - altered biotites - calcic amphiboles (green colour typical) - clinopyroxenes - quartz - oxides phenocrists - groundmass composed of volcanic glass and plagioclases microlites (andesite); some flow texture...	- plagioclases - calcic amphiboles - quartz - pyroxenes - scarce biotites - oxides phenocrists (vitric tuff/dacite)	- plagioclases - clinopyroxenes - orthopyroxenes - common calcic amphiboles - biotites-phlogopite - oxides - quartz - scarce olivine phenocrists and xenocrists

Table 6 : Main minerals found in the volcanic rocks of the Konya area [Temel et al., 1998].

The samples containing these types of inclusions are all the samples from the "volcanic glass content": ch06-15, ch07-31, ch07-32, ch06-13, ch07-24 and ch07-27. It is also likely that four samples from the Buff Fabric West Mound (ch06-01, ch06-06, ch07-03, ch07-10), and most of the samples from the low-fired dark fabric (ch06-18, ch06-20, ch07-23, ch07-35, and ch07-26) come from the Upper May river too.

This huge area can be divided into three main smaller areas according to the nature of the rocks and the sediments (Figure 49):

- Samples with a lot of volcanic glass and no limestone will come from the area A (for example ch06-06 or ch06-15);
- Samples with less volcanic glass but a limestone contribution will come from the area B (ch06-01, ch07-31,...);
- And finally, the samples with a more important contribution of limestone will come from the area C (ch07-24, ch07-27,...).

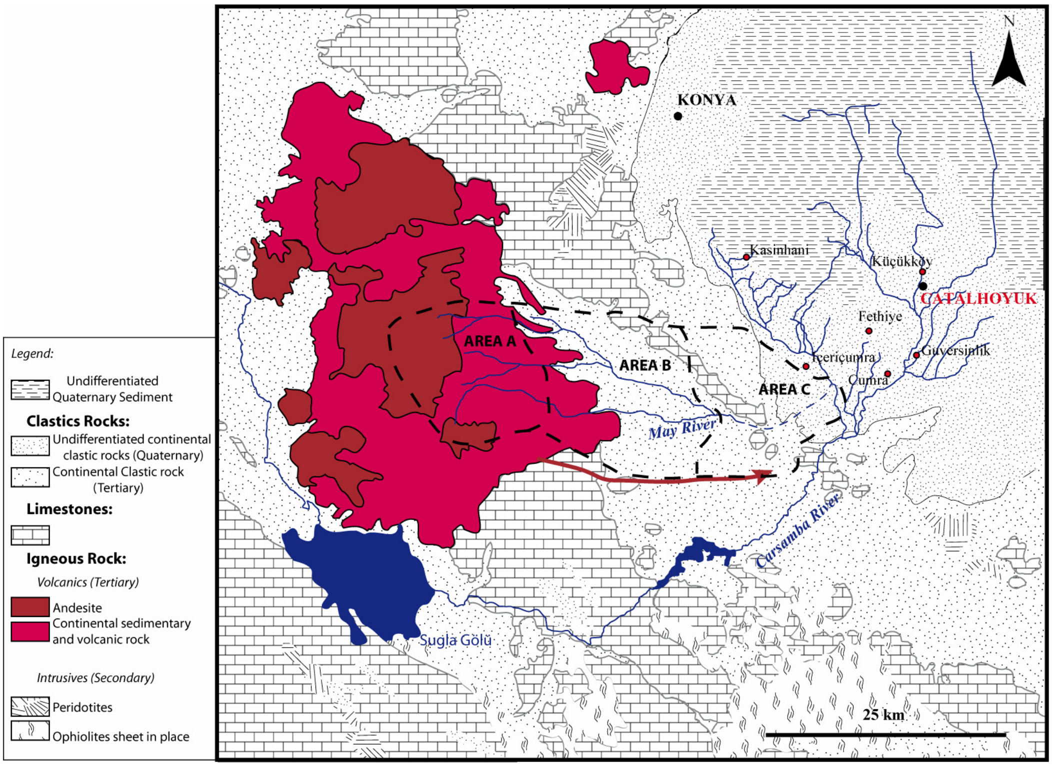


Figure 49 : Localisation of the provenance areas of the Upper May river.

B. Upper Çarşamba

As the May river, the Çarşamba is a karstic river.

The Taurus orogen is a very complicated group of mountains. It is chiefly composed of Devonian and Permo-carboniferous limestones and schists and Mesozoic limestones.

That is why the Çarşamba carries chiefly sedimentary inclusions such as micritic and sparitic limestones, reddish cherts and radiolarites, clactic rocks (Figure 50).

Because of the proximity of several fault and tectonised areas and of cource of the volcanic area described above, some metamorphic and volcanic inclusions can be found such as epidotes, garnets, phyllites, amphiboles and so on.

The "Phyllite division" regroups samples containing chiefly phyllites, and metasediments (ch06-17 and ch07-40). It is a possibility that the clay used for these potteries came from a primary clay of a faulted zone in this particular area (Area D in Figure 50).

One of the sample from the "Calcite Division" (ch06-19) presents a coarse to medium grained fabric with quartzites, metamorphic grains (schists, garnets,...), micritic intraclastes and calcite. The sample ch07-38 is quite similar to this last sample concerning the nature of the inclusions, even if the limestone contribution seems less important.

The lack of May volcanic inclusions suggests again a provenance from the faulted Taurus mountains for these two last samples (Area E in Figure 50).

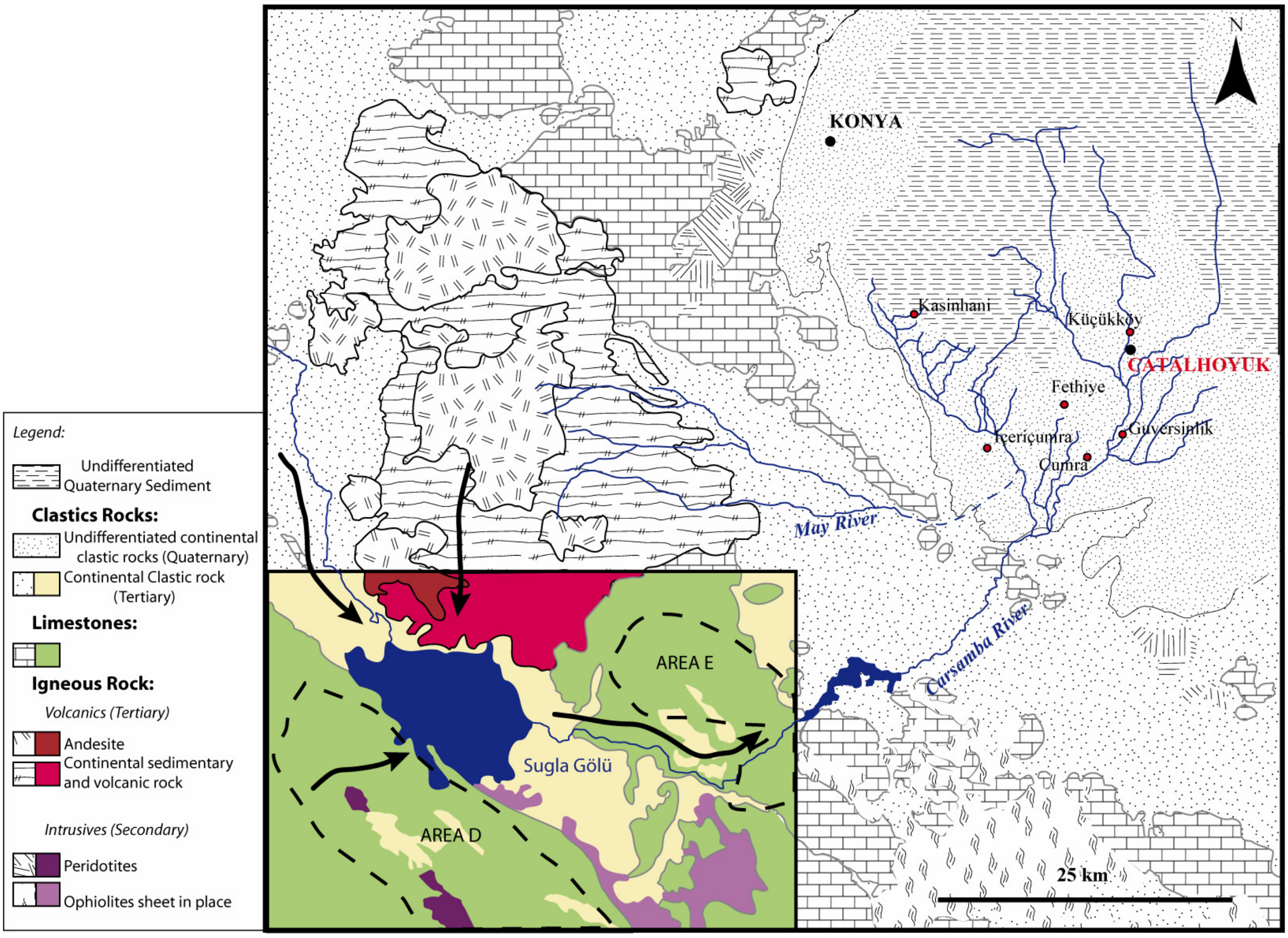


Figure 50 : Localisation of the provenance areas for the Upper Çarşamba river

C. Exotic

- *Calcite division*

The matrix of ch06-03 presents a moderately high shrinkage[4] clay. Usualy this phenomenon is avoided by the presence of the natural inclusions, but here the body seems made of a swelling clay such as smectites and it contains only scarce and very small grains (maily sandstones). That is why some relatively coarse inclusions have been added by the potter. These added grains are called tempers.

These polygonal inclusions of micritic and sparitic limestones could come from the lake sediments where the deposit process was standing water (Area I in Figure 51).

It is the same process for ch07-42, the matrix consists of a high shrinkage clay with scarce natural inclusions tempered with coarse banded limestones and micritic limestones.

On the north of Çatalhöyük, some banded-tufa can be observed. It could be a possibility that this sample was made from iron-rich clay of these cave and tempered with these banded- tufa.

- *Organic matter division*

Ch06-05 is a good example of the early Çatalhöyük Potteries.

This is a very low or short-fired fabric based on a high shrinkage clay containing scarce natural inclusions (volcanics, tectonised cherts, ...). It had been tempered with organic matter which could come from an area with standing water. One example is the KOPAL area (Figure 4) at the north base of the East mound.

Ch06-21 is a fine-grained fabric, almost grain-supported. The natural inclusions show a volcanic and a limestone contribution. The clay could consequently come from an area near the beginning of the fan, south-west of the site (Area 1 or 3, in Figure 55). This fabric had been tempered with plant stem.

The last sample organic matter tempered is ch07-34. This fabric presents two domains:

- a tectonic domain, with tectonic materials from the Upper Çarşamba such as phyllites, clay pellets, and other immature intraclastes (Area H in Figure 51).
- An organic matter domain, with plant stem tempers which could come from a clay in a standing water area (Area I in Figure 51).

Then, three samples contain some organic matter but as a natural inclusions. This is the case for ch07-12 which is a very fine silty fabric. Because of the firing, the organic matter is now difficult to see particularly on the outer surface but some phantoms can be observed. Their shape suggests very fine roots which could correspond to a natural fraction of the soil used for this pottery. The inclusions are volcanic and sedimentary so the clay could come from the south-west of the site.

The same remarks could be applied on ch07-20 too. It is a very fine-grained fabric with a high inclusions content composed of chiefly immature limestones and fine volcanics. The phantoms of organic matter are extremely thin. With the binocular some organic matter has been observed on a break and it looks like charcoal but this has to be checked.

In this group the sample ch07-30 is quite typical because it seems tempered with mainly organic pellets and some plant stems. However the hypothesis of a temper remains a question because of the aspect of this fabric. It is indeed a very fine-grained fabric with small angular volcanic inclusions and limestones intraclastes (chiefly immature). The organic matter seems very well incorporated to this clay and there is no evidence of shrinkage. Why this sample could not come from a midden and in that case, the organic pellets would be natural inclusions.

---

[4] Shrinkage : when the matrix present en extensive network of fractures/discontinuities. Due to a swelling clay, when during the firing H_2O evaporate.

- *Others*

Amoung the "others" division, the sample ch06-04 presents a non-local fabric consisting of dark clay with coarse fibreous amphiboles (asbestos). That suggests a primary clay from a tectonised area (area F, G in Figure 51, or others).

Ch07-29 contains a lot of volcanic inclusions and some tectonic grains: epidotes and garnets. These latter could be characteristic of a Çarşamba signature however the lack of phyllite or sedimentary rocks seems to suggest a non-local tectonised area source.

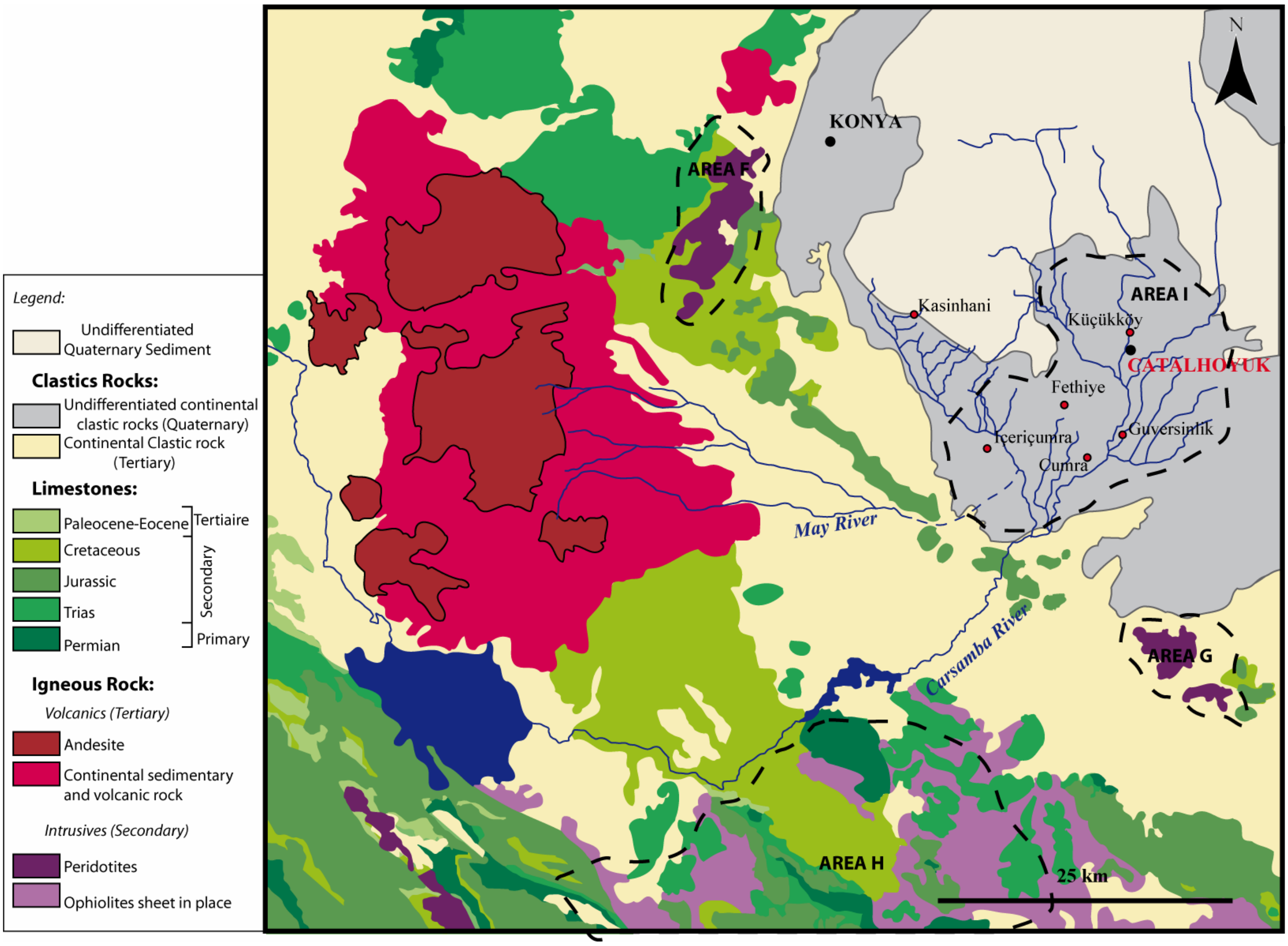


Figure 51 : Localisation of the provenace area for the "Exotic" group.

D. Basin Sediments

All the others samples contain a local clay coming from the Konya Basin. The fabric is mainly characterised by a calcareous-ferrugineous boby clay with a mixed of volcanics and limestones grains.

It is now obvious that the Konya basin can be characterised as a structural basin which the sediment fill is lime rich marls, enriched in clastic material (clay, marl, sand, gravel, and conglomerate) imported by rivers from the Taurus mountains, and by slope processes from the limestone and volcanic reliefs.

In 1965, De Ridder performed a complete study of these sediments and it sets out that:

- The limestones are characterised by a lack of a marine fauna and are therefore a fresh-water limestone.
- Althought rather thick beds of pure limestone occur, thin layers of calcareous clay and marl are found intercalated at many places. Reversely, thick layers of marl, interbedded with limestone are also found [De Ridder, 1965].
- It also points out than in the western part of the basin red clays, described as terra rossa, are interbedded in the limestone series.

Heavy minerals had also been examined during this study. Only the samples for the river beds of Çarşamba and the May as well as a sand spit sample near Çatalhöyük are reported in Table 7.

The conclusion was that the most prevalent minerals present are hornblende, augite and basaltic hornblende, with in some samples notably amounts of enstatite, hyperstene, saussurite, alterite and biotite.

The heavy mineral composition of the sample from a sand spit near Çatalhöyük shows high percentage of enstatite, green hornblende, opaques, augite and basaltic hornblende.

	Tourmaline	Zircon	Garnet	Staurolite	Andalusite	Epidote	Saussurite	Alterite	Hornblende, brown	Hornblende, green	Basaltic hornblende	Augite	Hyperstene	Titanite	Enstatite	Bitotite	Opaques
Çarşamba, river bed, Çumra			1%			1%	6%	6%	11%	12%	15%	46%	2%				32%
May, river bed, Ahmediye			1%		1%		1%		4%	26%	39%	8%	3%			17%	21%
Çatalhöyük, sand spit	1%					1%	1%	3%		22%	16%	20%	1%	2%	25%	8%	22%

Table 7 : Examples of heavy mineral composition of the sediments in the Konya Basin [Data from De Ridder, 1965].

Moreover, the upper 20m of the sediment cover was explored in order to draw a picture of the sand distribution (Figure 52).

This Figure demonstrates that the occurence of clastic sediments is chiefly confined to the area of entrance of such rivers as the Çarşamba, May, Meram and Sille. There is a tendency towards finer sediments in the direction of the basin.

In the subsurface of the basin, May sediments can be traced as far as the villages of Küçükköy and Dedemoğlu, where now the left and middle branches of the Çarşamba are running [De Ridder, 1965].

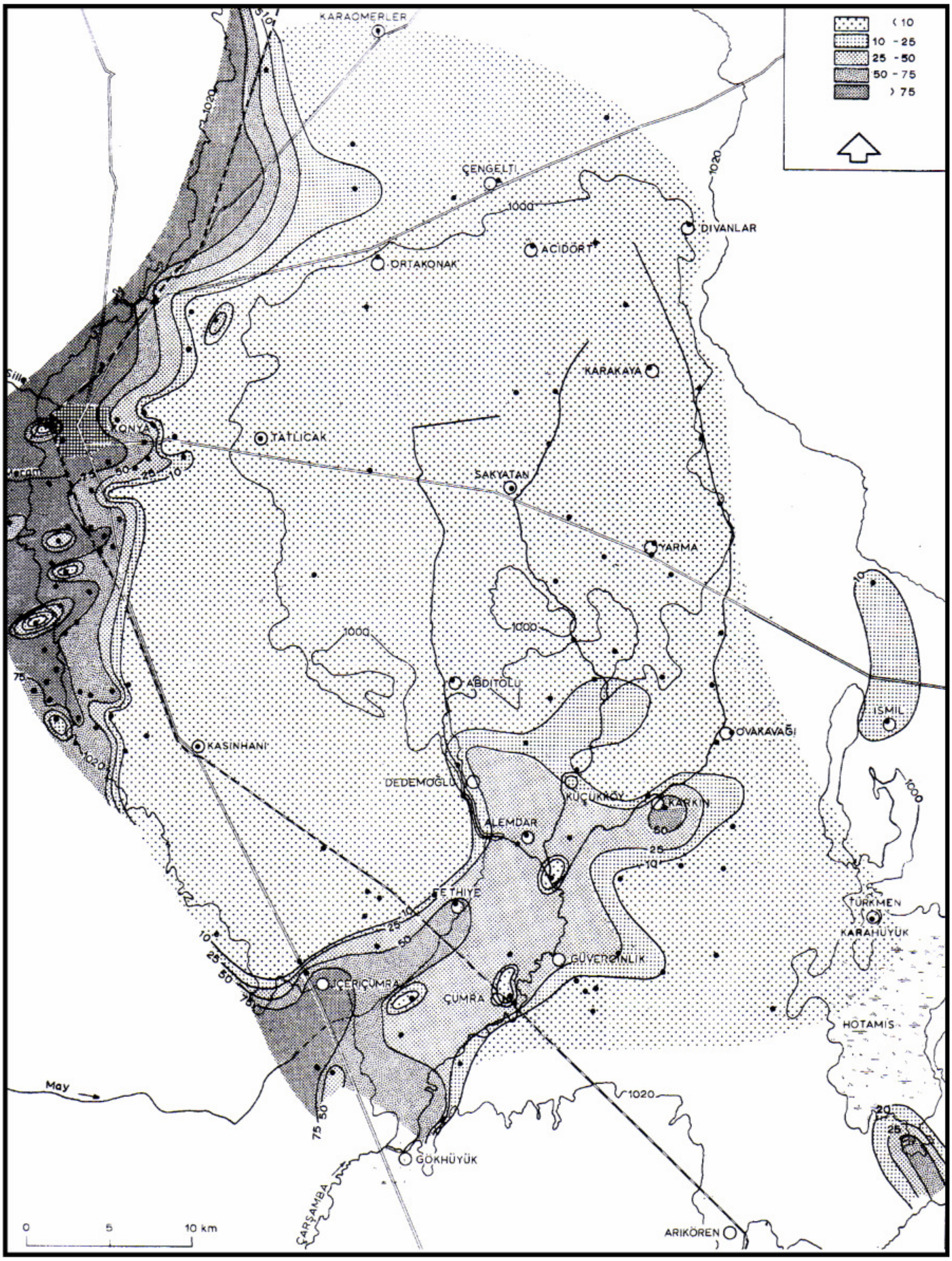


Figure 52: the percentage of sand in the upper 20m of the basin sediments [De Ridder, 1965].

This study has been used in order to divide the Konya Basin and more particularly the area of the Çarşamba-May fan into areas with specific characteristics (Figure 53):

- The area 1 could be an area with a volcanc contribution more important than in the area 2 where the Çarşamba is running;
- The area 3 is located after the sand ridge so the sedimentary contribution could be more important (particularly with the occurence of sandstones);
- The area 4 is located near the influence of the terra rossa and somes limestones: the sedimentary inclusions would be important;
- The area 5 corresponds to the lake marl which are situated at the border of the fan, so it could be reworked.

It would be interesting to check these hypothesis by a sampling.

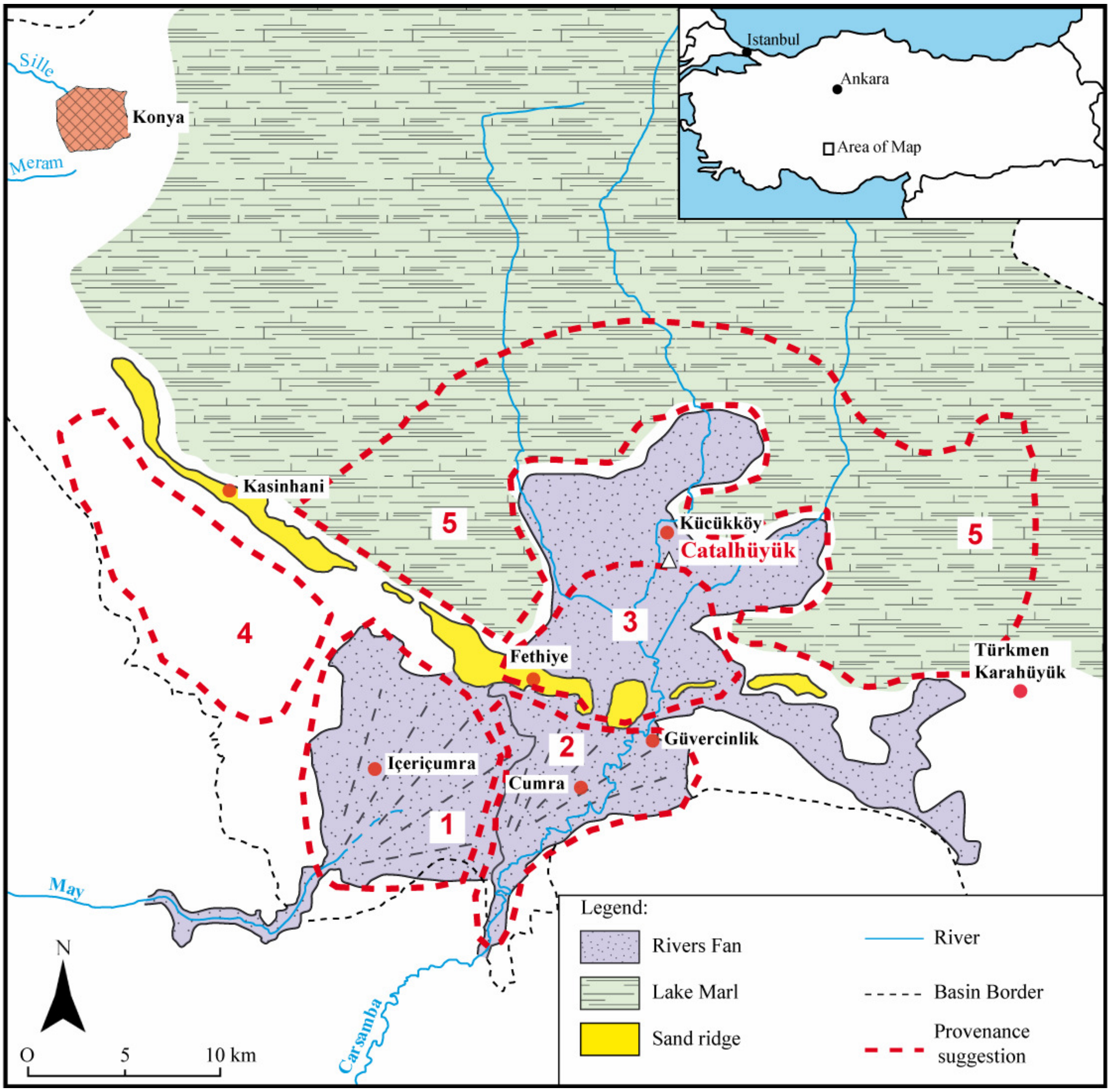


Figure 53 : Localisation of the provenance areas in the Konya Basin.

Each sample is presented in Table 8 in order to give an idea of the provenance within the fan. But we must take into account than sometime the difference between the samples is closed. This has been realised in order to give some questioning for the soon chemical analysis.

The marl based division was first but in the "exotic" division because the thin-section looks quite different from the others. However, these ceramics (ch07-08, ch07-33 and ch07-36) are made of Basin sediments, where the influence of the rivers is less strong. It is true there is still a volcanic contribution with some small amphiboles or andesitic groundmass, but the lack of weak minerals suggests a provenance farther from the influence of the May. The limestone contribution consists of coarser grains of imature and mature limestones. This fabric could be a reworking of a marl and consequently be settled at the limit influence of the river-lake sediment on the north or east of the site (Area 5 in Figure 53).

	Buff Fabric East Mound	Buff Fabric West Mound	Red Fabric West Mound	Low-Fired Dark Fabric	Marl Based
Overbank SW site (Area 1, 3 or 4 on the map)	CH06-16 CH07-28 CH07-39 CH07-41 CH06-12	CH06-08 CH07-01 CH07-18 CH06-02 CH07-04	CH06-09 CH07-02 CH07-16 CH07-06 CH07-13		
Bimodal SW site (Area 1 or 3 ?)	CH07-25		CH06-07 CH07-17 CH07-19 CH07-09	CH06-22	
Coarse SW site (Area 1 or 3)	CH07-37		CH06-11 CH06-10		
Overbank S site (Area 2 or 3)			CH07-14	CH06-14 CH07-07	
Coarse S site (Area 2 or 3)	CH07-21 CH07-22		CH07-05 CH07-11		
Reworked marl (Area5)					CH07-08 CH07-33 CH07-36

Table 8: Proposition of provenance for the samples which could come from Konya Basin area

Conclusion

Çatalhöyük is an important Neolithic-Chalcolithic site and several teams from different universities work on it.

The aim of the ceramic petrology studies is to verify and complete the fabric classifications made in the field by the archaeologists. The main point is to bring informations concerning the provenance of the clay used for these ceramics.

- <u>A new classification</u>

The 63 samples were closely observed on polarized microscope in order to determine the nature of the inclusions.

Only 10 samples studied are interpreted as having an "exotic" provenance and amoung them it has been demonstrated that 6 have been tempered (2 with sparitic limestones and 4 with organic matter).

Otherwise the 53 other samples contain volcanic and/or sedimentary inclusions, typical of the Konya region.

On the new classification ten groups have been proposed, six groups are based on the specific nature of the inclusions:

- The calcite division, with 4 samples;
- The phyllite division, with 2 samples;
- The organic matter division, with 6 samples;
- The volcanic glass division, with 6 samples;
- The marl based division, with 3 samples;
- And the non-local division, with 2 samples.

The four other groups are based on the colour of the ceramic as the samples were too similar (and fine-grained) in order to be distinguished by the nature of the inclusions:

- The Red Fabric West Mound, with 14 samples;
- The Buff Fabric East Mound, with 9 samples;
- The Buff Fabric West Mound, with 9 samples;
- And the "Low-Fired" Dark Fabric, with 8 samples. The firing experiment has validated that the "Low-fired" Dark Fabric were actually low-fired and that these samples could possibly be closed to some samples from the Buff Fabric West Mound.

- <u>First conclusions concerning the provenance</u>

Most of the samples (31) comes from the Çarşamba-May fan area with:

- 18 samples, interpreted as fine overbank silt;
- 5 samples with a bimodal distribution of the inclusions and interpreted as an overbank silt with occasional coarser laminae;
- 7 samples with coarser inclusions interpreted as a reworking of a channel

3 samples seem to come from an area where the influence of the rivers is less important and could correspond to a reworking of marl.

15 samples contain mainly volcanic inclusions and are interpreted as colluvium/alluvium of the Upper May river.

Only 4 samples seem to come from the Upper Çarşamba river. The two samples from the phyllite group are interpreted as primary clay from a tectonic area. And two samples from the calcite division with a lack of volcanics are interpreted as a colluvium of the limestones area near the Çarşamba.

- <u>Future works to do</u>

All of this work has of course to be confirmed by SEM analysis in order to characterise precisely the nature of the clay and also the type of minerals.

It could be also interesting to do a campaign of sampling in the Çarşamba-May fan area in order to have a mineral composition to compare with the ceramics. It is what the drilling campaign try to initiate but one should not forget that it is just the beginning of a new project which will last several years.

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