Microartifactual floor patterning: the case at Çatalhöyük

by Craig Cessford

Contents

▲ Abstract

Microartifact studies are a growing area of analysis, which generally focus on the density of materials in floor deposits as a means of identifying in situ traces of activities. The underlying assumption is that due to variety of taphonomic factors microartifacts are more likely to preserve evidence of such activities than either larger artifacts or permanent features. This is challenged by analysis of the data from Building 1 at Çatalhöyük, which indicates that on stratigraphically complex sites it is likely that a substantial component of the microartifact assemblage in floors is due to other factors. This is demonstrated by comparison of microartifact densities in floor deposits to other types of deposit such as wall plaster, dating of microartifacts and detailed examination of the nature of the material from floor assemblages. While microartifactual material from floor deposits is of interest, it is a complicated phenomenon, and remains from other contexts, particularly the fills of small transient features, may be more useful for studying microartifactual evidence of activities.

▲ Introduction

Microartifact studies utilise the systematic recovery of small items of material culture from archaeological deposits, by flotation or wet sieving, seeking to utilise information on artifact density distributions. This is used primarily to consider spatial patterning in floor deposits, to elucidate activities that took place on these surfaces in the past. From the inception of microartifact analysis on the Çatalhöyük Research Project, which excavates and studies the world famous Early Neolithic site in Anatolia previously excavated by James Mellaart in the 1960’s (Mellaart 1962, 1963, 1964, 1966, 1967, 1998; see also Hodder 1996, 2000) [Figure 1], it was anticipated that one of
the main applications of analysis of microartifacts would be to examine patterning within floor deposits to attempt to identify activities. This was perceived as being 'needed because the floors were carefully swept clean in antiquity' (Hodder 1999: 159), and that ‘these tiny fragments probably reflect some of the actual activities that took place on the floors, such as food preparation, cooking and obsidian working’ (Martin and Russell 2000: 61-63). Microartifact studies have concentrated upon Building 1 [Figure 2] in the North Area, completely excavated between 1995 and 1998, and it is on this structure, plus the preceding structure in the area, Building 5, that attention will focus for the purposes of this paper. The initial focus on the spatial and temporal variability of material in floor deposits fits well with the predominant focus of microartifact studies at other sites (Courty et al. 1993; Dunnell and Stein 1989; Fladmark 1982; Hassan 1978; Miller-Rosen 1989, 1993; Rainville 2000; Sherwood and Ostley 1995; Sherwood et al. 1995; Stein and Telset 1989).

![Figure 1: Location map](image)

Studies of microartifact patterning are primarily based upon the premise that microartifacts are more likely to represent traces of *in situ* activity than larger artifacts. The perception is that microartifacts will be swept into corners, trampled into floors, buried when floors are muddy or occur in build-ups of dust or ash. They are therefore perceived of as becoming almost incidentally incorporated into floor deposits rather than being moved around, or even totally removed, in a more intentional manner as larger artifacts might be. Essentially it is postulated that 'depositional sets' as recovered in the archaeological record are more directly related at the 'micro' level than the 'macro' level to 'activity sets and areas' that occurred in the past (Carr 1984: 114). Additionally microartifacts may
counteract ‘stereotypical designations for room function’ and allow for multi-functionality and changeability (Özbal 2000). There is no agreed methodology with regard to appropriate sample sizes, what sizes constitute the upper or lower range of microartifacts and which material types to consider (Dunnell and Stein 1989; LaMotta and Schiffer 1999; Lass 1994; Miller-Rosen 1993; Özbal 2000; Rainville 2000; Sherwood et al. 1995; Sherwood and Ostley 1995; Stein and Telset 1989). This is largely because of different conditions at different sites, both in terms of the materials present and pragmatic issues relating to time and resources, which necessitate different strategies.

The fundamental premise that microartifacts in floors relate to activities that took place on those surfaces is an attractive one, but is a premise that needs to be rigorously investigated and critiqued on a site-by-site basis, rather than simply assumed. This is particularly true on highly stratified and densely occupied tell sites such as Çatalhöyük, given their complex site formation processes. In particular there is evidence for relatively frequent disturbance of earlier deposits due to cut features and the recycling of material that had been previously been dumped in outside midden type areas.

▲ Methodology

As part of the basic Çatalhöyük Research Project methodology all deposits excavated are sampled for wet sieving and flotation, usually with a single thirty-litre sample. The material that sinks rather than floats during this process, commonly referred to as ‘heavy residue’, is then separated into different size ranges [>4mm (henceforth 4mm), <4mm and >2mm (henceforth 2mm) and <2mm and >1mm (henceforth 1mm)]. These are then sorted, and various types of material culture collected and weighed, allowing densities to be calculated.

This methodology is relatively common in Near Eastern prehistoric archaeology. The main difference as practised by the Çatalhöyük Research Project is that all deposits are sampled, rather than just those deposits that appear ‘significant’, typically defined as those particularly rich in material or floors. This allows the material from floors to be more fully contextualised. The ‘heavy residue’ processing system is also integrated into the general system of specialist analysis of material. This methodology has served to challenge the naively simplistic, but rarely explicitly stated, assumption underpinning most microartifact analyses, including that

~ 33 ~
undertaken initially by the Çatalhöyük Research Project itself, that all material recovered from floor deposits relates to *in situ* activity patterns. By examining a wider range of deposits it can reasonably be inferred that the material recovered from floor deposits relates to a wider range of depositional factors. In particular, the deliberate or incidental inclusion of material during initial deposit creation, rather than when deposits are being utilised, would mean that much of the material does not relate to *in situ* activities. Nonetheless it does appear that some of the material recovered from floor deposits does relate to *in situ* activities, for example where microartifact density evidence is supported by specialist identification of *in situ* bone working and obsidian knapping. A consideration of microartifact patterning is therefore still potentially useful with regard to identifying *in situ* activities, although it must be undertaken with due caution. There are a number of potential avenues for addressing the question of whether microartifacts in floor deposits relate to *in situ* activities. These include the application of absolute dating techniques, comparisons with other deposit types and specialist analysis of material. It is also crucial to address the issues of the floor hardness and coverings plus the relative duration of floor deposits.

## Floors and floor coverings

One obvious factor with regard to the relationship between microartifacts in floor deposits and activities that occurred on them is how likely it is that microartifacts would become incorporated into the floor deposits. At Çatalhöyük this appears to relate to two main factors, the hardness of the floor and the presence of floor coverings. The recent excavations have revealed a range of floor types that have been broadly categorised as baked, white clay, non-white laid, occupation and mixed. With the exception of baked, which relates mainly to the bases of ovens and hearths, all the other floors are relatively soft and it appears that microartifacts could, at least potentially, become incorporated into all these types of floor deposit relatively easily. Hard red painted fired lime plaster floors were found in early levels at Çatalhöyük in the 1960's (Mellaart 1966: 169 and fig. 2). Although no *in situ* examples of these have been found during the more recent excavations numerous fragments have been found in the early levels, along with evidence of lime burning (Farid forthcoming). Such floors are known from a range of sites in the Near East such as Aşıklı Höyük (Hauptmann and Yalin 2000) and activities on such hard surfaces would clearly be less likely to lead to the
incorporation of microartifacts.

Figure 2: General plan of first occupational phase of Building 1

Another factor with regard to the incorporation of microartifacts in floor deposits is the presence of floor coverings. A combination of evidence, including micromorphology, phytolith analysis and macroartifacts, suggests that a range of floor coverings were in use. Some parts of buildings appear to have been completely covered with plaited matting of varying degrees of fineness; whilst other areas had no such coverings although in some instances smaller spirally coiled mats were used. Such differences, which occur within individual structures, may well have had an impact upon the incorporation of microartifacts into underlying floor deposits.

▲ Duration

If microartifact remains in floors do relate to activities that occurred on them, then an assessment of the temporal duration of different floor deposits is crucial. A variety of approaches including analysis of radiocarbon dates, ethnographic analogies and the counting of wall plasters, believed to possibly occur annually, suggest that buildings at Çatalhöyük were occupied for between fifty and a hundred years (Cessford forthcoming; Mellaart 1964: 117, 1967, 50; Newton and Kuniholm 1999). Within this, however, the length represented by different floor deposits varies. Some floor deposits might survive for the entire occupation of a structure, whereas others are of shorter duration lasting for only a specific phase. Floors in different areas of a structure were replaced at different points in time, meaning that different sets of floor deposits do not represent the same lengths of time.
Comparing densities of material in different floor deposits is therefore made problematic by the fact that higher densities might simply represent floors of longer temporal duration. Given the apparent impossibility of precisely estimating the temporal duration of different floor deposits this severely compromises approaches based upon density.

### Absolute dating

One possible mechanism for determining if microartifacts in floor deposits relate to *in situ* activities or not is absolute dating. Material from several sets of plastered floors in Building 1 were dated using Accelerator Mass Spectrometry (AMS), in particular charred seeds and faunal material from the same floor deposits. AMS determinations, where there is a good relationship between the material being dated and the archaeological event it is derived from, such as those from *in situ* food storage contexts, show that determinations from charred seeds in floor deposits are either slightly earlier than or broadly contemporary with the occupation of Building 1. Although it is not possible to definitively demonstrate that any of the charred seeds from floor deposits are older than the context in which they occur Bayesian statistical analysis, using the program BCal (Buck et al. 1999), demonstrates that it is statistically probable that a substantial minority are. The likelihood is that around a fifth to a quarter of the charred seeds from floor deposits that were dated are residual.

Comparison of two sets of paired determinations from floor deposits, where both charred seeds and faunal material were dated, show that there is a 62.9% and 83.8% level of probability that the faunal material is earlier than the charred seeds. Although not conclusive this strongly suggests that the faunal material is residual.

The discrepancy between determinations on charred seeds and faunal material can be partially explained by a number of factors. Determinations on bone relate not to the precise time of death, but more broadly to the lifetime of the animal. This is likely to have had a relatively minor impact, especially given the mortality profile, which shows almost 70% of the sheep and goats were immature when they died. Small amounts of contamination from the surrounding matrix are possible given the poor survival of collagen at Çatalhöyük (pers.comm. Tom Higham). Comparing the determinations on faunal material from floors with other determinations on faunal material and human skeletal remains indicates that this factor cannot
account for the whole discrepancy. Reservoir effects sometimes found in human bone (Cook et al. 2002; Lanting and van der Picht 1998) are unlikely to have had an impact on animal bones. Another possibility is that the faunal material was deliberately curated. This certainly occurred at Çatalhöyük, with certain animal bones such as cattle skulls and horns being used as wall installations. Such bones did occasionally eventually end up in floor deposits. These assemblages are, however, recognisable and there is no indication that this has occurred in the floor deposits under consideration.

The determinations on faunal material are not from single entities but from a number of fragments, probably from different animals. As such they are problematic in terms of dating evidence (Ashmore 1999), but this does not invalidate the conclusion that at least some of the faunal material from these floors was residual when it was deposited. In contrast the charred seeds were broadly contemporary with the floor deposits they were found in, although this in no sense demonstrates that they relate to \textit{in situ} activities and it is probable that some are older.

\section*{Other deposit types}

Another method for determining if microartifacts in floor deposits relate to \textit{in situ} activities is to compare the material found in them to similar non-floor deposits. The white plaster floors found at Çatalhöyük are visually similar to white plasters found on walls and micromorphological examination indicates that both are made of similar white calcareous clay sediments (Matthews et al. 1996: 304). This phenomenon is known from other Near Eastern sites where wall and floor plasters are made of similar materials (Matthews et al. 1994). Given that microartifacts in wall plasters are unlikely to relate to \textit{in situ} activities taking place on vertical surfaces, a comparison of these two deposit types should prove useful. Results are available from two excavation areas, referred to as North and South [Table 1], which allow us to compare the median densities of chipped stone and bone at three different fraction sizes, expressed as grams per litre. The results show that the wall plasters often contain a substantial percentage of the density of materials found in the white plaster floors, and in some instances, actually have higher densities of material. While these results suggest that some of the material found in white clay floors may relate to \textit{in situ} activities, they clearly
indicate that a substantial proportion of the material does not.

Detailed specialist analysis of faunal material from wall plasters in Building 1 revealed that in general they have low densities of material and the fragments are small, usually not exceeding two centimetres. Beyond this general pattern there is a good deal of variation. Some plasters include digested bone indicative of dog faeces while some do not, some have very fresh bone whilst others have worn pellets. The profiles of the different wall plasters variously resemble assemblages from 'clean' floors, 'dirty' floors, 'low traffic' floors, and 'empty' fills. They are not very different from what is found in other kinds of constructional material such as brick, mortar and packing, except that some of these at least sometimes have higher densities or larger pieces. The general impression is that ‘floor assemblages’ are largely the contents of the floor construction material. At any rate, the wall plaster assemblages are not strikingly different from floor assemblages.

**Specialist analysis**

Microartifact studies are generally based upon densities of material. More detailed specialist analysis of materials is crucial to understanding if this material relates to *in situ* activities on floors or not. Botanical material should provide a good example, as AMS dating has demonstrated that botanical material is at least broadly contemporary with the floor deposits in which it is found. This makes it preferable to faunal material, which is likely to be residual. Chipped stone, the only other category of material that occurs frequently enough to warrant such analysis, suffers from the problem that very little specialist analysis was undertaken of the microartifacts from the North Area.

Analysis of the composition of the archaeobotanical assemblages indicates that over half of the samples from the North Area can be said to fit into one of two 'standard sample profiles' for relative material composition (Julie Near pers.comm; Fairbairn et al. forthcoming). The first ‘standard sample profile’ comes from a wide variety of types of deposit, including construction materials, fills and floor deposits. It is also found in a wide variety of stratigraphic locations and the range of material represented includes virtually all of the types of archaeobotanical material found at Çatalhöyük. On the basis of this it is interpreted as representative of tertiary or very mixed deposits and can be thought of as ‘background noise’,
rather than relating to \textit{in situ} activities. The second ‘standard sample profile’ contains a much more limited range of materials and probably represents material from less fully mixed deposits. Nonetheless it still occurs in a variety of depositional contexts and stratigraphic locations and contains a wide enough range of material that it does not appear to relate to \textit{in situ} activities. Floor deposits that conform to the two ‘standard sample profiles’ are therefore highly unlikely to relate to \textit{in situ} activities.

A number of floor samples diverge somewhat from the ‘standard sample profile’. When this occurs it is often impossible to tell if this difference relates to \textit{in situ} activities or some other factor. Comparison with nearby samples from other types of context or with other floor deposits in similar spatial locations can indicate if this divergence is likely to relate to \textit{in situ} activities. Higher than typical densities of nutshell in floor deposits near to fire installations are one example of this. Although these only represent a relatively minor divergence from the ‘standard sample profile’ their repeated occurrence in successive phases suggests they do represent \textit{in situ} activities. This is supported by the discovery of clusters of acorns in a similar spatial location in Building 1. Possibly nuts were stored and shelled near to fire installations, or were taken there to be burnt. A small number of floor deposits demonstrate unique botanical compositions that diverge markedly from the ‘standard sample profile’. These are likely to be derived from \textit{in situ} activities although it is impossible to rule out the existence of some other factor.

\textbf{Beyond the visible}

Another method by which it is possible to determine if botanical materials relate to \textit{in situ} activities is to utilise a range of specialist studies. Examples of complimentary techniques include analysis of phytoliths (microscopic silt-sized particles usually composed of opaline silica that form in the cells of certain plants) (Miller-Rosen 1999) and the elemental composition of floor deposits as determined by ICP AES (Middleton and Price 1996). When these were applied to the floors of Building 5 they demonstrated the storage of wheat and barley in bin structures and the storage in baskets and processing of cereals in a nearby area (Miller-Rosen forthcoming). Analysis of several botanical samples from floor deposits in this area produced ‘standard sample profiles’, that gave no indication of the activities taking place, presumably
because there was nothing in these areas to char the material.

One obvious potential source of comparative data is between microartifact analysis and information on inclusions gleaned from soil micromorphology. Plant, bone, groundstone and obsidian have all been identified micromorphologically at Çatalhöyük, although they are mainly found in contexts such as external middens that are richer in inclusions than floors (Matthews forthcoming; Matthews et al. 1996: 306-11). There are a number of issues with comparing microartifact and micromorphology data. The microartifact densities in floor deposits are often relatively low and the materials in question, such as obsidian, are very rarely revealed by micromorphology. This is because the micromorphological evidence covers an extremely limited part of the deposit. When such relatively rare materials are present this appears to be largely fortuitous and the micromorphological presence and absence of these cannot realistically be utilised as evidence. The limited part of a deposit revealed by micromorphology means that it is necessary to extrapolate this data to compare it to microartifact data, which covers the entire deposit. This assumes a homogenous spread of inclusions throughout a deposit. Microartifact analysis of deposits that have been subdivided for sampling purposes shows that this assumption is unwarranted, as there is often strong spatial variation within deposits. Whilst micromorphology can provide extremely precise data for a restricted part of a deposit microartifact data provides more general data at a larger scale for deposits as a whole. Another issue is that microartifact densities based on weight and volume are effectively a three-dimensional value, whereas micromorphological quantification of density is essentially a two-dimensional measure. This means that straightforward comparisons are problematic. Many of the inclusions revealed in floor deposits by micromorphology, such as charred plant remains, are smaller than 1mm in size and would therefore not been recovered during microartifact processing at Çatalhöyük. As deposition of microartifacts can be shown to be a strongly scalar phenomenon this means that micromorphological and microartifact data on different sizes of inclusions cannot be easily related. These issues mean that detailed comparison of microartifact and micromorphological data is complicated. It is perhaps preferable to think of the two techniques as complimentary and able to provide insights on each other rather than as being directly comparable.

▲ If not the floors then where?

~ 40 ~
If the relationship between the microartifacts in floor deposits at Çatalhöyük and *in situ* activities is a problematic one, are there any other contexts that might produce microartifact assemblages that do relate to nearby activities inside buildings? One possibility is a number of relatively short-lived features, such as shallow scoops and stakeholes. Unfortunately these do not occur in all occupational phases and are not found in all areas of buildings so their usefulness is limited, but it does appear that the microartifacts they contain relate to activities that occurred on nearby floor surfaces just prior to these features being filled.

The clearest example at Çatalhöyük is a group of three stakeholes (1390), (1391) and (1392) forming an arc around the southern side of a small circular hearth F.369 during phase B1.4 [Table 2; Figure 3], which contained a range of microartifacts. Stakehole (1392) contained fifty-five pieces of obsidian, mainly unretouched small flakes and debris and a fragmentary projectile/biface tip [Figure 4]. By density this is the second highest 4mm heavy residue value and the third highest at 2mm. The obsidian appears to be related to knapping activities linked to the hearth, a conclusion supported by the fact that ashy deposits frequently contain high densities of obsidian, and the end of the projectile point is unused and possibly unfinished. What is particularly notable is the high degree of variation in the obsidian in the three stakeholes: (1392) contained over thirteen grams of obsidian, (1390) had around a third of a gram and (1391) had none. In contrast, stakehole (1390) had a high density of faunal and botanical material. Almost all of the faunal material seems to be derived from a single very young sheep/goat and has similar surface conditions and colour, with the exception of a burnt phalanx from a more mature sheep/goat. The material originates throughout the body and is highly fragmented, with only tiny fragments of each bone surviving. It appears the stakehole contains part of a consumption event, which was rapidly buried. The botanical assemblage from stakehole (1390) contains an unusually high concentration of hackberry (such concentrations are often found associated with fire installations), plus some charcoal that is atypically dominated by willow/poplar, as opposed to oak, usually the most common element. Stakehole (1390) is dated by a determination on included cereal chaff and grain (OxA-11031 [7675±50]), a result that suggests that this material is broadly contemporary with this occupation phase.
As well as lacking obsidian (1391) contained no faunal material but had a high density of botanical remains, with very little cereal and more herbaceous material than is usual for the site. The identifiable charcoal from (1391) was pure oak. The densities of microartifacts in these stakeholes and the nature of the material that they contain vary markedly from the patterns that can be identified as ‘background noise’. Each individual stakehole appears to represent a discreet assemblage. Whilst it is impossible to be certain, the most probable conclusion is that these relate to activities in the immediate vicinity. In contrast, the obsidian, faunal, botanical and charcoal assemblages from both the nearby floor deposits and the hearth itself do not appear to be related to in situ activities as they fit the standard profiles and appear to simply represent ‘background noise’.
A number of shallow scoops have also produced reasonably convincing evidence for microartifact concentrations that are distinctive enough to be reasonably construed as the residues from contemporary activities on nearby floors. For instance (1328), the fill of scoop [1453], has a botanical assemblage that diverges markedly from the 'standard sample profiles'. Approximately one third of the sample is parenchyma, a slightly smaller percentage is plant stem material and the remainder is composed of wood and cereal. This composition is very atypical for fills and it seems likely that this fill is related to activities that took place on nearby floors. The trends in this assemblage are similar to those in a nearby set of floor deposits (1422), by considering a wider range of deposit types than just floors it is possible to make a stronger case for the identification of in situ activities. The faunal assemblage from (1328) is quite high in density but lacks coherence with a mixture of burning and weathering. It appears that the scoop may be catching the smaller fragments that are kicking around the floor and often get cleaned up more elsewhere.

**Conclusion**

Microartifact studies clearly have a great deal to contribute to our understanding of archaeological sites. The case study of Çatalhöyük has indicated that here at least, and potentially at many other sites as well, the traditional focus of microartifact studies on attempting to discern in situ activities on floors is problematic. Variations in floor types, depositional practices and other factors between sites mean that the lessons from Çatalhöyük can not simply be applied to other sites, but they do highlight potential issues and the need to critique the underlying assumptions of microartifact analysis on a site by site basis. The particular issues raised that are of more general applicability include:

- The importance of studying as wide a range of depositional contexts as to understand microartifacts in floor deposits.
- The role of floor hardness, coverings and duration in the incorporation of microartifacts into floor deposits.
- The usefulness of absolute dating techniques in determining the contemporaneity of microartifacts and the deposits in which they occur.
- The importance of integrating microartifact analysis with
as wide a range of other forms of specialist analysis as possible.

Densities of material appear to represent a rather blunt instrument for approaching this question, although they may be more applicable on stratigraphically simpler sites. The focus upon quantity of material, whereby relatively disparate categories of material are treated as single entities, rather than the composition, taphonomy, or diversity of assemblages may not be the most useful approach to the detection of activities. The methodology adopted by the Çatalhöyük Research Project, whereby the microartifacts from a wide range of types of depositional context were studied has allowed those from floor deposits to be more richly contextualised. This challenges the assumption that these can be easily related to in situ activities and indicates that much of the material is unlikely to do so. It could be argued that this represents an academic ‘straw man’, by portraying microartifact studies as uncritically assuming that all floor material relates to in situ activities, while most studies accept the existence of a level of ‘background noise’ and that it is the differences in density that are assumed to relate to activities. If the latter is true, it is rarely explicitly stated and in any case is itself a problematic proposition. It assumes that ‘background noise’ is a spatially and temporally constant factor that can be ‘filtered’ out, by assuming that the lowest density observed equates to the level of ‘background noise’.

This analysis has focussed primarily upon archaeobotanical and to a lesser extent faunal microartifacts. This is largely because these are among the most common microartifactual inclusions in floor deposits. Archaeobotanical material was preferred over faunal material due to the results of the AMS dating which suggest that the faunal material is residual. The only other relevant material that occurs with a similar frequency is chipped stone, this has not been considered as specialist analysis of this material in the North Area has focussed almost exclusively on larger artifacts so comparative data was not available. It could be argued that archaeobotanical material is amongst the most easily and frequently disturbed types of inclusion in deposits. Whilst this perception may be true in certain contexts the results of the AMS dating in the North Area and elsewhere (Cessford 2001, forthcoming) and archaeobotanical analysis (Fairbairn et al forthcoming) suggest that this is not true at Çatalhöyük. Whilst it is true that archaeobotanical material is frequently found in secondary and
tertiary contexts this appears to be due to specific disturbance rather than more generalised factors such as bioturbation.

Analysis of the wide range of contexts sampled at Çatalhöyük and the patterning within units where there should be no impact from activities suggests that the level of microartifactual inclusions is highly variable and, at a practical level, it is almost impossible to distinguish the ‘background noise’ element. The application of absolute dating techniques to this material, comparison of floor deposits with wall plasters, specialist analysis of the composition of assemblages, the application of complimentary forms of analysis such as phytolith and chemical composition all indicate that microartifact densities can not be taken as simply indicative of in situ activities. This work also suggests ways whereby this can be assessed, and elements within larger assemblages that may relate to such activities can be identified. The analysis of a wider range of context types also leads to the identification of other depositional contexts, such as a range of transient features, which may preserve microartifactual evidence of activities.

▲ Acknowledgements

The work presented here derives from the efforts of the entire Çatalhöyük Research Project team, in particular those who studied the faunal material [Louise Martin and Nerissa Russell], botanical material [Julie Near], phytoliths [Arlene Miller-Rosen], charcoal [Eleni Asouti], ICP/AES [William Middleton], who were very generous with their data. I would also like to thank Anja Wolle, Sarah Cross, Shahina Farid and Ian Hodder. The radiocarbon determinations presented were part of a larger group funded by NERC and undertaken at the Oxford Radiocarbon Accelerator Unit of the Research Laboratory for Archaeology and the History of Art, where I would particularly like to thank Tom Higham. I would also like to thank Caitlin Buck for her help with BCal.

▲ Tables

Table 1

<table>
<thead>
<tr>
<th>North Area White Clay</th>
<th>North Area Wall Plasters</th>
<th>South Area White Clay</th>
<th>South Area Wall Plasters</th>
</tr>
</thead>
</table>

~ 45 ~
Table 2

<table>
<thead>
<tr>
<th></th>
<th>Stakehole 1390</th>
<th>Stakehole 1391</th>
<th>Stakehole 1392</th>
</tr>
</thead>
<tbody>
<tr>
<td>Obsidian</td>
<td>0.30g</td>
<td>none</td>
<td>13.34g knapping debris</td>
</tr>
<tr>
<td>Faunal</td>
<td>14.0g mainly very young sheep/goat</td>
<td>none</td>
<td>none</td>
</tr>
<tr>
<td>Botanical</td>
<td>Hackberry concentration 0.09g</td>
<td>Herbaceous material 0.02g</td>
<td>none</td>
</tr>
<tr>
<td>Charcoal</td>
<td>Dominated by willows/poplars 34 out of 63 identifiable fragments</td>
<td>Pure oak 60 out of 60 identifiable fragments</td>
<td>none</td>
</tr>
</tbody>
</table>

**Bibliography**


**Craig Cessford**

Craig Cessford studied archaeology at Newcastle University before becoming a full time field archaeologist. He became involved with the Çatalhöyük Research Project in 1997 and has been employed by them full time since 1999 with responsibility for post-excavation and publication work on the North Area of the site which was excavated between 1995 and
1998, absolute dating and analysis of heavy residue.

He can be contacted at:
McDonald Institute for Archaeological Research, University of Cambridge and cc250@cam.ac.uk.

© Cessford 2003
© assemblage 2003