

# CHAPEL FARM, ELSWICK, LANCASHIRE



## ENVIRONMENTAL ANALYSIS



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Prepared by: Elizabeth Huckerby  
Position: Environmental Manager  
Date: September 2006

Checked by: Alison Plummer  
Position: Senior Project Manager  
Date: September 2006  
Signed.....

Approved by: Alan Lupton  
Position: Operations Manager  
Date: September 2006  
Signed.....

**Oxford Archaeology North**

Storey Institute  
Meeting House Lane  
Lancaster  
LA1 1TF  
t: (0044) 01524 848666  
f: (0044) 01524 848606

w: [www.oxfordarch.co.uk](http://www.oxfordarch.co.uk)  
e: [info@oxfordarch.co.uk](mailto:info@oxfordarch.co.uk)

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Janus House  
Osney Mead  
Oxford  
OX2 0EA  
t: (0044) 01865 263800  
f: (0044) 01865 793496

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## SUMMARY

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Prior to the development of a redundant farm building at Chapel Farm, Elswick, Lancashire (NGR SD 421 386) Lancashire County Archaeology Service recommended that an archaeological building investigation should be undertaken of the extant remains of the building. This was undertaken by Chris O'Flaherty, historic Buildings Consultant.

In addition to brick walls and extant crucks the remains of the farm building included one short section of earth walling comprising clay and chopped straw. Oxford Archaeology North (OA North) was commissioned wall by Chris O'Flaherty on behalf of the owner Mr C Gornal to undertake the environmental analysis of a sample of the clay. The analysis was undertaken in August and September of 2006.

A sample of collapsed clay wall was collected by the owners and delivered to OA North. A sub-sample of this was processed by hand flotation in-house. The various constituents of the wall were weighed and their percentages calculated. The largest percentage of material, 78.38% of the sample, comprised fine minerogenic material. Small stones and pebbles (aggregate) represented 12.22% and organic material (including straw, chaff, leaf and wood fragments and insect remains) the remaining 9.40%.

The bulk of the organic material was made up of crop processing waste, which had been deliberately chopped. It contained undifferentiated cereal grains and bread wheat, frequent bread wheat rachis segments and undifferentiated culm nodes. Weed seeds from a number of different habitat types were also recorded.

Animal dung/bedding may also have been used in the construction of the walls as testified by the strong aroma of pig manure during processing of the sample. The presence of insect remains and fly puparia also suggest that some of the processed plant material had been exposed to the atmosphere for sometime prior to its inclusion in the clay.

The results of the analysis have been compared with the archaeobotanical analysis of daub samples from Althrey Hall, Clwyd (Carruthers 1990) and Old Manor House Risley (Carruthers 2003). They have also been compared to documentary evidence from the Solway Plain (Jennings 2003) and Wales (Nash 2000).

It was not possible date the building as part of the current programme of analysis but recommendations for possible dating techniques have been made. These include the taking of samples from the cruck for dendrochronological dating and submitting samples of the crop processing waste for AMS radiocarbon dating.

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Sandra Bonsall, Denise Druce and Elizabeth Huckerby undertook the analysis. Elizabeth Huckerby wrote the report. Alison Plummer edited the report, and also managed the project.

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## 1. INTRODUCTION

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### 1.1 CIRCUMSTANCES OF THE PROJECT

- 1.1.1 Chris O’Flaherty Historic Building Consultant undertook an historic building investigation of the redundant agricultural building at Chapel Farm, Elswick, Lancashire (NGR SD 412 386). The building investigation was undertaken as the result of a recommendation from Lancashire County Archaeology Service (LCAS) and was carried out prior to development works taking place. As part of the building investigation Oxford Archaeology North (OA North) were commissioned to undertake the analysis of a sample of clay wall retrieved from the site.
- 1.1.2 The remains of the agricultural building, which was in a ruinous state, comprised two brick-built gable end walls, a brick-built long-wall and the remains of the clay wall. With the exception of two crucks and a number of purlins very little survived of the roof structure. The timbers had suffered from fire damage. The clay wall appeared to be inset from the crucks and the brick walls offset.
- 1.1.3 The analysis was undertaken in September 2006 by environmental archaeologists at OA North. This report sets out the results of the analysis.

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## 2. METHODOLOGY

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### 2.1 PROCESSING

2.1.1 A 5.5kg sub-sample of the clay wall was soaked overnight in hot water and calgon to break up the clay matrix during which time a strong smell of pig was noted. The sample was hand-floated and the flot retained on a 250micron mesh, weighed and retained wet. It was sieved through a series of sieves of known mesh sizes (2mm, 500 and 250microns).

### 2.2 ANALYSIS

2.2.1 The different fractions were examined with a low-powered binocular microscope and all plant material was identified and recorded on a scale of 1-5, where 1 is rare (less than 5 items in the sample) and 5 is abundant (more than 100). The matrix of the sample was also noted. Pebbles and stones present were collected and weighed. Plant nomenclature follows Stace (1991).

2.2.2 The original sample contained a limited quantity of small twig fragments, and in order to determine whether or not this was indicative of the wall having been constructed around a wooden framework a second sub-sample was soaked overnight and sieved through a series of meshes.

### 3. RESULTS

#### 3.1 THE MAKE-UP OF THE CLAY WALL

- 3.1.1 The clay wall was made up of small stones and pebbles, finer minerogenic particles, and plant (including twigs) and insect remains. Table 1 (below) illustrates the amount of each fraction in the sub-sample. Fine minerogenic particles, including clay, sand and other soil fractions constituted 78.38% of the sample, with 12.22% small stones and a total organic content of 12.51%.
- 3.1.2 There was no evidence from the sample that was submitted for analysis for the clay wall having been burnt. However, photographs of the crucks clearly show that these had suffered from fire damage.

Type of material	Weight in grams	Percentage
Organic	501	9.11
Larger twigs	16	0.29
Small stones and pebbles	672	12.22
Fine minerogenic material	4311	78.38
Total weight of sub-sample	5500	100

Table 1: Make up of the clay wall

#### 3.2 PLANT REMAINS

- 3.2.1 The results of the analysis of the plant remains are shown in Table 2 below. The bulk of the plant remains comprised crop processing waste, with some grass stems, and dicotyledenous leaf and wood fragments. Occasional cereal grains and weed seeds were also recorded. The cereal grains were thought to be wheat, with one grain firmly identified as bread wheat. The crop processing waste included abundant fragments of bread wheat rachis segments, cereal culm nodes and other straw fragments. The size of the waste varied from 10mm to 60mm with the majority in the range of 15mm-20mm.
- 3.2.2 The sample contained weed seeds from a number of different ecological groupings, including plants of cultivated and waste ground such as common stichwort (*Stellaria media*), black bindweed (*Fallopia convolvulus*) and shepherds purse (*Capsella bursa-pastoris*). In addition, the presence of small grass seeds, common nettle (*Urtica dioica*) and ribwort plantain (*Plantago lanceolata*) indicate areas of grassland or ruderal communities, and blackberry (*Rubus fruticosus*) and birch (*Betula* sp) indicate that some scrub/wood communities were nearby.



- 3.2.3 The woody twig recorded in the first sub-sample has been identified as undifferentiated Maloideae wood. This family includes amongst other taxa hawthorn (*Crataegus monogyna*), both cultivated and crab apple (*Malus sp*), pear (*Pyrus*), and mountain ash/whitebeam (*Sorbus sp*).
- 3.2.4 The sample also contained insect puparia and other insect remains. The puparia suggest that the plant remains had been exposed to the atmosphere before they were incorporated into the wall.

Crop processing waste		5
Bread wheat rachis segments		5
Culm nodes		5
Wheat grains		2
Bread wheat		1
<b>Weed seeds</b>		
Asteraceae undiff	Daisy family undiff	1
<i>Betula sp</i>	Birch	1
<i>Capsella bursa-pastoris</i>	Shepherd's purse	1
<i>Fallopia convolvulus</i>	Black bindweed	1
<i>Plantago lanceolata</i>	Ribwort plantain	1
Poaceae <2mm	Small grass seeds	2
<i>Ranunculus repens</i> -type	Buttercups	1
<i>Rubus fruticosus</i> -type	Blackberry	1
<i>Stellaria media</i>	Common stitchwort	1
<i>Urtica dioica</i>	Common nettle	2
<b>Matirx components</b>		
Leaf fragments		3
Fragments of twigs	Maloideae undifferentiated	2
Insect remains		2
Fly puparia		2
Bryophyte fragments		2
Mollusc shell		1
Coarse sand		5

Table 2: Plant remains recorded in the clay wall on a scale of 1-5.

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## 4. DISCUSSION

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### 4.1 SYNTHESIS

- 4.1.1 Although the construction of earth structures is very well documented (Historic Scotland 1996; English Heritage/ICOMOS 2000; Jennings 2003; OA North 2006) there have been very few attempts at the environmental analysis of the composition of the clay (Carruthers 1990; 2004). Therefore, the analysis of the sample from the barn at Chapel Farm has been a unique opportunity to study the construction of such buildings.
- 4.1.2 Jennings (2003) has suggested that clay-built walls in Cumbria, similar to those found at Chapel Farm, consisted of 80% aggregates and 20% binder. The aggregate is described as small stone and rounded pebbles, and the binder as clay. At Chapel Farm, however, the clay sample comprised 12.22% aggregate, with 9.4% organic material and 78.38% finer minerogenic particles.
- 4.1.3 Straw, as generally observed within clay walls, is thought to have been added to prevent cracking as the walls dried out (Jennings *ibid*). The straw at Chapel Farm may have originated from dung or animal bedding as suggested by the strong smell of pig noted throughout processing. The relatively standard size of the straw fragments (15-20mm) suggests deliberate chopping. The daub samples from the Old Manor House, Risely, analysed by Carruthers (2003), demonstrated the use of crop processing waste in its manufacture. In addition, the poor state of preservation of the remains and the unpleasant smell detected from the sample suggested that dung or animal bedding might have been incorporated into the daub at Risley.
- 4.1.4 Evidence from the Chapel Farm clay sample suggests that crop processing waste incorporated into it derived from wheat. In Wales, chopped wheat straw was commonly used to bind clom (clay), along with chaff, rushes, bracken, and even some moss and animal hair (Nash 2000). However, at Risely two-rowed barley was the predominant crop, although the occasional remains of bread wheat and cultivated oats were also recorded. Weeds from grassland, waste ground and cultivated land were also recorded in the samples at Risely, and the sample from Chapel Farm contained weeds from similar habitats, as well as birch seed and wood fragments.
- 4.1.5 There is no conclusive evidence for the presence of a wooden framework within the clay, despite the occasional wood fragments observed in the first sub-sample. No wood fragments were observed in the second sub-sample.
- 4.1.6 Clay buildings are a characteristic style of vernacular architecture seen throughout the world in regions where other building materials are scarce (Jennings 2003). In Wales they are often associated with poorer rural communities where building stone and good quality oak were not readily available (Nash 2000). This would have been the case in the Fylde, where pollen evidence from Fenton Cottage suggests that there was considerable clearance of the landscape from cal AD 1047-1280 (820±50 BP; GU-5142)

accelerating after cal AD 1430-1640 (390±50 BP; GU-5141) to the present day (Middleton *et al* 1995).

## 4.2 RECOMMENDATIONS

- 4.2.1 The dating of clay structures is largely speculative but four dendrochronological dates taken from roof timbers of clay buildings on the Solway Plain suggest a late 15th century to 16th century date (Jennings 2003). However, Jennings does state that these dates only give a felling date for the timbers not the actual date of construction of the buildings.
- 4.2.2 ***Dendrochronological dating***: it was not possible to date the building at Chapel Farm from the environmental analysis of the clay wall. However, it might be possible to obtain a felling date for the timber used in the crucks through the process of dendrochronological dating.
- 4.2.3 ***AMS radiocarbon dating***: should the crop processing waste prove suitable for AMS radiocarbon dating, then there would be the potential for it to provide a very broad date of construction for the wall, and confirm whether or not the walls are later than the crucks as suggested.

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**Head Office/Registered Office/  
OA South**

Janus House  
Osney Mead  
Oxford OX2 0ES

t: +44 (0) 1865 263 800  
f: +44 (0) 1865 793 496  
e: [info@oxfordarchaeology.com](mailto:info@oxfordarchaeology.com)  
w: <http://oxfordarchaeology.com>

**OA North**

Mill 3  
Moor Lane  
Lancaster LA1 1QD

t: +44 (0) 1524 541 000  
f: +44 (0) 1524 848 606  
e: [oanorth@oxfordarchaeology.com](mailto: oanorth@oxfordarchaeology.com)  
w: <http://oxfordarchaeology.com>

**OA East**

15 Trafalgar Way  
Bar Hill  
Cambridgeshire  
CB23 8SQ

t: +44 (0) 1223 850 500  
e: [oaeast@oxfordarchaeology.com](mailto: oaeast@oxfordarchaeology.com)  
w: <http://oxfordarchaeology.com>



**Director:** Gill Hey, BA PhD FSA MCifA  
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