

## Environmental Samples

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Eleven bulk sediment samples were taken from excavated features at Land East of Chalgrove for the recovery of charred plant remains, charcoal and small artefacts. Each sample was processed by the team at Oxford Archaeology South (OAS) using a modified Siraf style flotation machine. The volume of processed sediment for each sample is recorded in Table 1. Flots were collected onto 250µm meshes and the heavy residues were sieved to 500µm, after which both flots and residues were dried in a heated room. The residues were sorted by eye for artefacts and ecofactual remains.

The entirety of each sample was examined under a Leica EZ4D stereomicroscope and any identifiable charred plant remains were extracted. These were then identified with the use of published guides<sup>1</sup> and the modern reference collection held at Oxford Archaeology South, and were then quantified and tabulated. The results for each sample are shown in Table 1. One sample was found to contain highly abundant terrestrial molluscs and so a record was made of the main taxa present and their relative abundance, although identifications are provisional and not exhaustive; nomenclature follows Anderson<sup>2</sup> and ecological information is based on Kerney<sup>3</sup>.

Although charcoal was preserved to some extent in all eleven samples, it was often low in quantity and of small size. Two samples contained sufficient charcoal to merit further examination: sample 10, from mid or late Bronze Age pit 2236, and sample 3, from the terminus of Middle Iron Age ring gully 166. While normally it is preferable to identify around 100 pieces in order to fully characterise the diversity of wood taxa in an assemblage, this was only possible in the charcoal rich sample 10: charcoal in sample 3 was mostly less than 4mm in size and only 50 pieces were identifiable. Each selected charcoal fragment was fractured and examined on the transverse, radial and tangential sections as necessary at up to x400 magnification using a Brunel SP-400BD metallurgical microscope. Species identifications were made on the basis of diagnostic anatomical characteristics, using criteria in Hather<sup>4</sup> and Schweingruber<sup>5</sup>. Results for both samples are shown in Table 2. Nomenclature for plant and wood taxa follows Stace<sup>6</sup>.

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<sup>1</sup> Cappers, R T J, Bekker R M, and Jans, J E A 2006 *Digital Seed Atlas of the Netherlands*. Groningen Archaeological Studies 4, Barkhuis Publishing, Eelde, The Netherlands; Jacomet, S 2006. *Identification of cereal remains from archaeological sites (2<sup>nd</sup> edition)*. Archaeobotany Lab, Basel University.

<sup>2</sup> Anderson, R. 2005. An annotated list of the non-marine molluscan of Britain and Ireland. *Journal of Conchology*. 38 (6).

<sup>3</sup> Kerney, M. 1999. *Atlas of the Land and Freshwater Molluscs of Britain and Ireland*. Colchester: Harley Books.

<sup>4</sup> Hather, JG. 2016. *The Identification of Northern European woods: a guide for Archaeologists and Conservators*. Abingdon: Routledge.

<sup>5</sup> Schweingruber, F. 1990. *Microscopic Wood Anatomy (3<sup>rd</sup> edition)*. Birmensdorf: Swiss Federal Institute for Forest, Snow and Landscape Research.

<sup>6</sup> Stace, C. 2010. *New Flora of the British Isles (3<sup>rd</sup> Edition)*. Cambridge: University Press.

### Area A

Much of the settlement activity in this area dates to the Middle Iron Age. A group of ring gullies represent the remains of several roundhouses. Ring gully 20 contained two pits which were both sampled (samples 1 and 2). A further four samples are associated with concentric ring gullies 165 and 166: sample 3 from the terminus of gully 166 and sample 4 from gully 165. Samples 5 and 6 are from postholes within these gullies, with sample 5 sandwiched between the two gullies and sample 6 close by, just within the inner gully.

Charred plant remains were generally sparse in the samples taken from this area, although sample 3, in particular, contains a larger range of items. Although most of the poorly preserved and often fragmentary cereal grains from these samples could not be identified to genus, wheat (*Triticum* sp) and probable barley (*Hordeum vulgare*) were recovered from sample 3. However, the utilisation of wheat on this part of the site during this period is confirmed by small quantities of charred glume bases in most of the samples in this group. While these glume bases were often fragmentary and often could not be distinguished as either emmer (*Triticum dicoccum*) or spelt (*T. spelta*), several examples were clearly spelt. In sample 3, a single glume base showed characteristics suggestive of emmer wheat, although this may be due to variation within spelt populations and its morphological overlap with emmer. Campbell and Starker argue that where emmer has been recovered from Iron Age sites in the Thames Valley, it probably represents a contaminant, with spelt wheat having displaced emmer in the area by this time<sup>7</sup>. The fairly limited range of weed seeds from the samples included those of arable fields, such as scentless mayweed (*Tripleurospermum inodorum*), stitchworts (*Stellaria* sp) and cleavers (*Galium aparine*), plants of more general open or rough ground (grasses, Poaceae; dock, *Rumex* sp), as well as those which are indicative of damp conditions, such as blinks (*Montia fontana*), spike-rush (*Eleocharis* sp) and sedge (Cyperaceae).

### Area B

A single sample was taken from Area B: sample 8 from ditch 1056 could not be dated, but is truncated by a mid/late Roman ditch. This sample contained few charred plant remains, but was rich in terrestrial molluscs. *Vallonia* sp and *Trochulus hispidus* were especially numerous, but there were also frequent *Carychium* sp, *Pupilla muscorum*, *Vertigo* sp and *Cochlicopa* sp, and occasional examples of shading-loving *Discus rotundatus* and freshwater/wet ground taxa *Anisus leucostoma*, *Valvata piscinalis*, *Galba truncatula*, *Psidium* spp, and *Succinea/Oxyloma*, amongst others. This presumably reflects the presence of water in the ditch for at least part of the year, and also the shaded conditions in the base of the ditch.

### Area C

Sample 9 is from an isolated, undated posthole. A single large legume is of a size and shape consistent with *Vicia faba* (field bean), but lacks the diagnostic surface characters required to confirm this identification. Evidence from elsewhere in Britain suggests that field bean had become

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<sup>7</sup>Campbell, G and Straker, V. 2003. Prehistoric crop husbandry and plant use in Southern England: development and regionality. In Robson Brown, K A (ed), *Proceedings of the Archaeological Sciences Conference, University of Bristol, 1999*. Oxford: BAR International Series 1111.

an important crop by the Middle Bronze Age<sup>8</sup>. Although there is frequent cereal grain in this sample, much of it is poorly preserved, shrunken or clinkered, so that few are identifiable to genus.

Sample 10 is from middle or late Bronze Age pit 2236, the only feature of this date at the site. Little identifiable material was recovered, with cereal grain often fragmentary or otherwise indeterminate. However, while the small number of weed seeds show a similar range to those seen in the Middle Iron Age samples from this site – bedstraws, grasses, clovers and other small legumes – in contrast, two of the small number of glume bases in the sample were identifiable as emmer wheat, while clearly spelt-like glumes were absent. The south of England saw a shift away from the cultivation of emmer to spelt wheat, believed to have started in the Middle Bronze Age and continuing, with regional variation, into the Iron Age<sup>9</sup>. The presence of emmer at Chalgrove in a mid to late Bronze Age context is in keeping with other contemporary sites in the south of the country, although early records of spelt have been found elsewhere in Oxfordshire, such as from Middle Bronze Age contexts at Yarnton<sup>10</sup>.

Sample 12 is taken from Late Roman pit 2127. The cereal grain is generally in a poor state of preservation, and the chaff is mostly fragmentary. The weed seed assemblage does not differ considerably from that seen at the site in earlier periods, hinting that cultivation regimes had not significantly altered, although such interpretations are tentative with such a small number of seeds to consider.

#### *Charcoal*

Figure 1 shows the relative proportions of wood taxa identified in the terminus of Middle Iron Age ring gully 166 (sample 3) and from mid to late Bronze Age pit 2236 (sample 10). It can be seen that the Middle Iron Age sample is more diverse, with a fairly equal division between oak (*Quercus* sp), blackthorn or cherry (*Prunus* type), hazel (*Corylus avellana*), hawthorn type (belonging to the Maloideae, a group of species difficult to distinguish using anatomical characteristics and which also includes whitebeam, apple and rowan), and ash, plus occasional field maple (*Acer campestre*). In contrast, Bronze Age sample 10 is dominated by oak, with smaller proportions of both *Prunus* and Maloideae types.

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<sup>8</sup> Treasure, ER and Church, MJ. 2017. Can't find a pulse? Celtic bean (*Vicia faba* L.) in British prehistory. *Environmental Archaeology* 22 (2), 113-127.

<sup>9</sup> Campbell, G and Straker, V. 2003. Prehistoric crop husbandry and plant use in Southern England: development and regionality. In Robson Brown, K A (ed), *Proceedings of the Archaeological Sciences Conference, University of Bristol, 1999*. Oxford: BAR International Series 1111.

<sup>10</sup> Hay, G, Bell, C, Dennis, C and Robinson, M 2016. *Yarnton: Neolithic and Bronze Age Settlement and Landscape*. Thames Valley Landscapes Monographs 3.

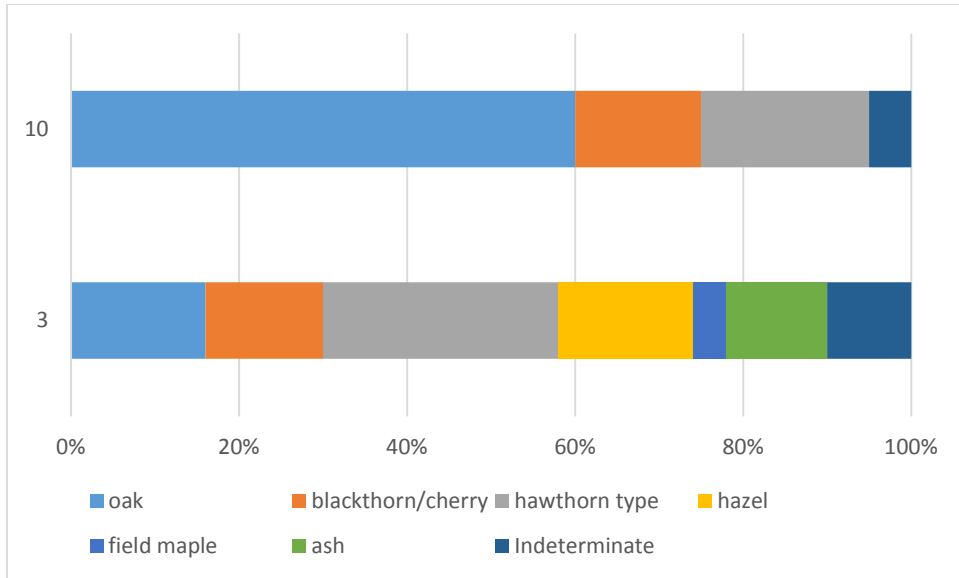


Figure 1: Proportions of wood taxa in samples 3 and 10

Table 1: Charred Plant Remains from Land East of Chalgrove

|                                     |                         | Area                | A    | A    | A                   | A          | A        | A        | A            | B       | C        | C     | C       |
|-------------------------------------|-------------------------|---------------------|------|------|---------------------|------------|----------|----------|--------------|---------|----------|-------|---------|
|                                     |                         | Sample No           | 1    | 2    | 3                   | 4          | 5        | 6        | 7            | 8       | 9        | 10    | 12      |
|                                     |                         | Context No          | 81   | 92   | 98                  | 102        | 126      | 128      | 134          | 1062    | 2258     | 2238  | 2128    |
|                                     |                         | Cut No              | 80   | 91   | 97                  | 101        | 125      | 127      | 133          | 1056    | 2257     | 2236  | 2127    |
|                                     |                         | Feature Type        | Pit  | Pit  | Ring gully terminus | Ring gully | Posthole | Posthole | Pit/Posthole | Ditch   | Posthole | Pit   | Pit     |
|                                     |                         | Date                | MIA  | MIA  | MIA                 | MIA        | MIA      | MIA      | Undated      | Undated | Undated  | M/LBA | L Roman |
|                                     |                         | Processed Volume    | 30L  | 16L  | 36L                 | 35L        | 10L      | 12L      | 30L          | 18L     | 5L       | 36L   | 40L     |
|                                     |                         | Flot Volume         | 20ml | 10ml | 35ml                | 30ml       | 25ml     | 5ml      | 10ml         | 30ml    | 10ml     | 500ml | 20ml    |
|                                     | <b>Charcoal &gt;4mm</b> |                     | 4    | 2    | 6                   | 23         | 19       | 6        | 5            | 3       | 3        | 178   | 7       |
|                                     | <b>Charcoal 4-2mm</b>   |                     | 26   | 29   | 177                 | 239        | 100      | 20       | 10           | 1       | 10       | 1000  | 13      |
| <i>Triticum sp.</i>                 | wheat                   | grain               |      |      | 2                   |            |          |          | 2            | 11      | 18       | 8     | 11      |
| <i>cf Hordeum vulgare</i>           | cf barley               | grain               |      |      | 3                   |            | 1        |          |              |         | 1        |       |         |
| Cereal                              | indeterminate cereal    | grain               | 2F   | 6    | 14                  | 17         | 2        |          | 2            | 7       | 40       | 9     | 28      |
| Cereal                              | indeterminate cereal    | grain fragments     |      |      | 38                  | 13         |          | 1        |              |         | 58       | 16    |         |
| <i>Triticum spelta</i>              | spelt wheat             | glume base          |      |      | 9                   | 3          |          |          |              |         | 2        |       | 7       |
| <i>Triticum spelta</i>              | spelt wheat             | spikelet fork       |      |      | 1                   |            |          |          |              |         |          |       |         |
| <i>Triticum dicoccum</i>            | emmer wheat             | glume base          |      |      |                     |            |          |          |              |         |          | 2     |         |
| <i>Triticum cf dicoccum</i>         | cf emmer wheat          | glume base          |      |      | 1                   |            | 1F       |          |              |         |          |       |         |
| <i>Triticum dicoccum/spelta</i>     | emmer/spelt wheat       | glume base          | 2    | 4    | 86                  | 24         |          |          |              |         | 16       | 12    | 63      |
| <i>Triticum sp.</i>                 | wheat                   | spikelet base       | 1    |      |                     | 2          |          |          |              |         | 1        |       |         |
| <i>Hordeum vulgare</i>              | barley                  | rachis              |      |      | 1F                  |            |          |          |              |         |          |       |         |
| <i>Avena sp.</i>                    | oat                     | floret base         |      |      | 1F                  |            |          |          |              |         |          |       |         |
| <i>Avena sp.</i>                    | oat                     | awn fragments       |      |      | 5                   | 2          |          |          |              |         | 2        |       | 4       |
| Cereal                              | indeterminate cereal    | rachis internode    |      |      | 2                   |            |          |          |              |         |          |       |         |
| Cereal                              | indeterminate cereal    | detached embryo     |      |      | 1                   | 1          |          |          |              |         | 1        |       | 1       |
| Cereal                              | indeterminate cereal    | detached coleoptile |      |      |                     |            |          |          |              |         |          |       | 1       |
| <i>Corylus avellana L.</i>          | hazel                   | nutshell            | 1F   |      | 5F                  | 4F         | 2F       | 1F       |              |         |          | 3F    |         |
| Fabaceae                            | indeterminate legume    | seed                |      |      |                     |            |          | 1F       |              |         |          |       |         |
| <i>Trifolium/Melilotus/Medicago</i> | clover/melilot/medicago | seed                | 2    |      | 4                   |            |          |          |              |         | 1        | 1     | 1       |
| <i>Pisum/Vicia</i>                  | pea/vetch (6mm)         | seed                |      |      |                     |            |          |          |              |         | 1        |       |         |
| <i>Pisum/Vicia/Lathyrus</i>         | pea/vetch/tare (4mm)    | seed                |      |      |                     | 1          |          |          |              |         |          | 1F    |         |

|   |                   |      |  |   |        |        |   |  |   |         |   |        |
|---|-------------------|------|--|---|--------|--------|---|--|---|---------|---|--------|
| <i>Vicia/Lathyrus</i>                           | vetch/tare (2mm)  | seed |  | 1 | 3 + 3F | 2      |   |  |   | 2 + 18F |   | 1 + 9F |
| <i>Persicaria</i> sp.                           | knotweed          | seed |  |   |        | 1      |   |  |   |         |   |        |
| <i>Rumex</i> sp.                                | dock              | seed |  | 2 | 14     | 3      |   |  | 1 | 2       |   | 5      |
| Caryophyllaceae                                 | pinks family      | seed |  |   | 1      |        |   |  |   |         |   |        |
| <i>Stellaria</i> sp.                            | stitchwort        | seed |  |   | 1      | 1      |   |  |   |         |   |        |
| <i>Chenopodium/Atriplex</i>                     | goosefoot/orache  | seed |  |   | 18     | 2      |   |  |   |         | 1 | 1      |
| <i>Montia fontana</i> L.                        | blinks            | seed |  |   |        | 2      |   |  |   | 1       |   |        |
| <i>Galium aparine</i> L.                        | cleavers          | seed |  | 1 | 1 + 5F |        |   |  |   | 1 + 5F  |   |        |
| <i>Galium</i> sp.                               | bedstraws         | seed |  |   |        | 1 + 1F |   |  |   |         | 1 | 2      |
| <i>Plantago lanceolata</i> L.                   | ribwort plantain  | seed |  |   |        |        |   |  |   |         |   | 1      |
| <i>Plantago</i> sp.                             | plantain          | seed |  |   |        |        |   |  |   |         |   | 1      |
| <i>Euphrasia/Odontites</i>                      | eyebright/bartsia | seed |  |   |        |        |   |  |   | 1       |   | 1      |
| Asteraceae                                      | daisy family      | seed |  |   | 1      |        |   |  |   |         |   | 1      |
| <i>Tripleurospermum inodorum</i> (L.) Sch. Bip. | scentless mayweed | seed |  |   |        | 2      |   |  |   |         |   |        |
| <i>Tripleurospermum</i> sp.                     | mayweed           | seed |  |   | 1      |        |   |  |   |         |   | 1      |
| Apiaceae  | carrot family     | seed |  |   |        |        | 1 |  |   |         |   |        |
| Cyperaceae                                      | sedge family      | seed |  |   | 2      |        |   |  |   |         |   |        |
| cf Cyperaceae                                   | cf sedge family   | seed |  |   | 1      | 1      |   |  |   |         |   |        |
| <i>Eleocharis</i> sp.                           | spike-rush        | seed |  |   | 1      |        |   |  |   |         |   |        |
| Poaceae (small)                                 | small grass       | seed |  |   | 8      | 2      | 1 |  |   | 5       |   | 2      |
| Poaceae (medium)                                | medium grass      | seed |  |   | 6      | 3      |   |  |   | 5       | 1 | 14     |
| Poaceae (large)                                 | large grass       | seed |  |   | 2      | 6      |   |  |   | 1       |   | 4      |
| <i>Avena/Bromus</i>                             | oat/brome         | seed |  | 1 |        |        |   |  |   |         |   |        |
| Indeterminate                                   |                   | seed |  |   | 10     | 8      |   |  |   | 8       |   | 1      |

F = fragment or incomplete item

Table 2: Charcoal identified from samples 3 and 10

|                               | Sample No                             | 3          | 10         |
|-------------------------------|---------------------------------------|------------|------------|
|                               | Context No                            | 98         | 2238       |
|                               | Cut No                                | 97         | 2236       |
|                               | Feature Type                          | Ring gully | Pit        |
|                               | Date                                  | MIA        | M/LBA      |
| <i>Prunus</i> sp.             | blackthorn/cherry                     | 6          | 14         |
| Maloideae                     | hawthorn/apple/<br>whitebeam/rowan    | 11         | 16         |
| cf Maloideae                  | cf hawthorn/apple/<br>whitebeam/rowan | 2          | 3          |
| <i>Prunus</i> /Maloideae      | blackthorn/cherry/<br>hawthorn type   | 2          | 2          |
| <i>Quercus</i> sp.            | oak                                   | 7 (h)      | 59 (h, r)  |
| cf <i>Quercus</i> sp.         | cf oak                                | 1          | 1          |
| <i>Corylus avellana</i> L.    | hazel                                 | 7          |            |
| cf <i>Corylus avellana</i> L. | cf hazel                              | 1          |            |
| <i>Acer campestre</i> L.      | field maple                           | 2          |            |
| <i>Fraxinus excelsior</i> L.  | ash                                   | 6          |            |
| Ring porous                   |                                       |            | 1          |
| Diffuse porous                |                                       | 3          |            |
| Indeterminate                 |                                       | 2          | 4          |
| <b>TOTAL</b>                  |                                       | <b>50</b>  | <b>100</b> |

h = heartwood, r = roundwood