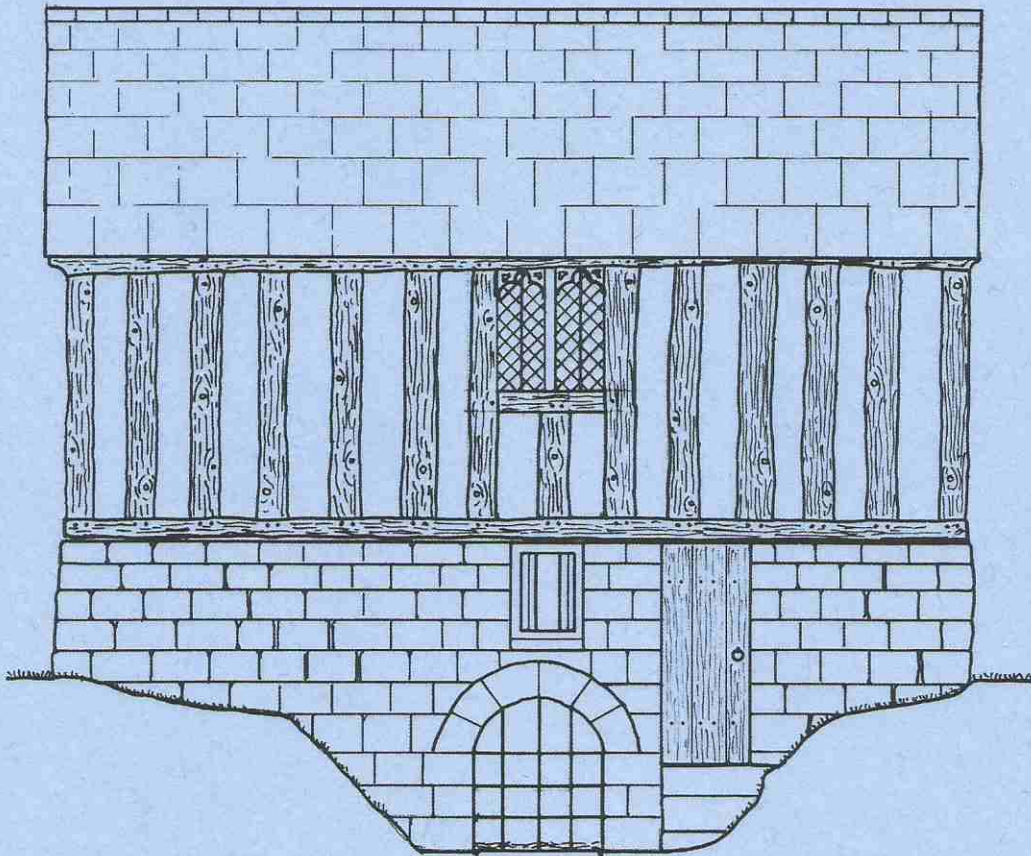


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Front cover: St Winifred's Well, Woolston: reconstruction of the north elevation of the Phase 1 chapel

IRON AGE AND ROMANO-BRITISH OCCUPATION AT CRAVEN ARMS ENCLOSURE B, SHROPSHIRE: INVESTIGATIONS IN 2013

By TIM MALIM and THOMAS WELLICOME

The investigations at Craven Arms B exposed the north-western corner and a length of the northern ditches for a square enclosure, associated with external activity which spanned approximately 200 years. A double-ditched enclosure, external oven and V-shaped ditch for a timber stockade are interpreted as representing the first phase of activity, dating to late prehistoric times. During the first century AD the outer enclosure ditch was recut, and subsequent activity during the first to second centuries was evidenced by infill of the enclosure ditch, two corn-drying ovens, two possible timber structures, a ditch and a pit. The alignment and regularity of these features indicate a planned element to the site. Activity continued in the second to third centuries with a remodelling of the outer enclosure ditch, gullies indicating a fence line (possibly a parallel enclosure) and compacted surfaces around the entrance, other ditch features and decommissioning of the ovens and structures. The site appears to have been abandoned in the third century, with evidence for possible flooding interspersed with archaeological features across much of the site. Post-medieval activity consisted of two different types of land drain, indicating that water management on the site has been a recurring theme over the centuries.

Artefactual evidence consisted of pottery including prehistoric sherds, samian, amphorae, Severn Valley ware, Malvern ware, and Black-burnished ware. Dating from this pottery assemblage suggests activity can be attributed to a period from first to third centuries AD, whilst scientific dating from C14 and OSL have provided dates from the first century BC to third century AD and that the natural silt and gravel superficial geology was deposited between 5017–3275 BC. Bayesian modelling based on these dates and the stratigraphic sequence has modelled a probable period of 115 years for activity at the site, which started during the period cal AD 35–120 (68% probability) and ended during the period cal AD 90–165. Palaeoenvironmental analysis has identified charred cereal grains of barley and wheat (although no processing on site), as well as plant species that favoured wetland margin environments and meadowland, and timber and brushwood resources, which might have been used as fuel.

EXCAVATION

INTRODUCTION

Between January and March 2013, a programme of archaeological investigation was carried out on land south of Unit 16 Craven Arms Business Park, Stokewood Road, Craven Arms, prior to development. The programme consisted of investigation of a grassed recreational area to the south of the existing Highways Depot (Colour Plate 1), (NGR SO 4302 8327). A

secondary phase of work, undertaken in September 2013, was carried out to reduce ground levels in the development area to working depth. This revealed further features that were not located during the initial phase of work because of the masking effect of silt deposited from flooding episodes. Finally in January and February 2014 a watching brief was undertaken during clearance of the boundaries around the north-eastern, eastern, and south-eastern parts of the site, the

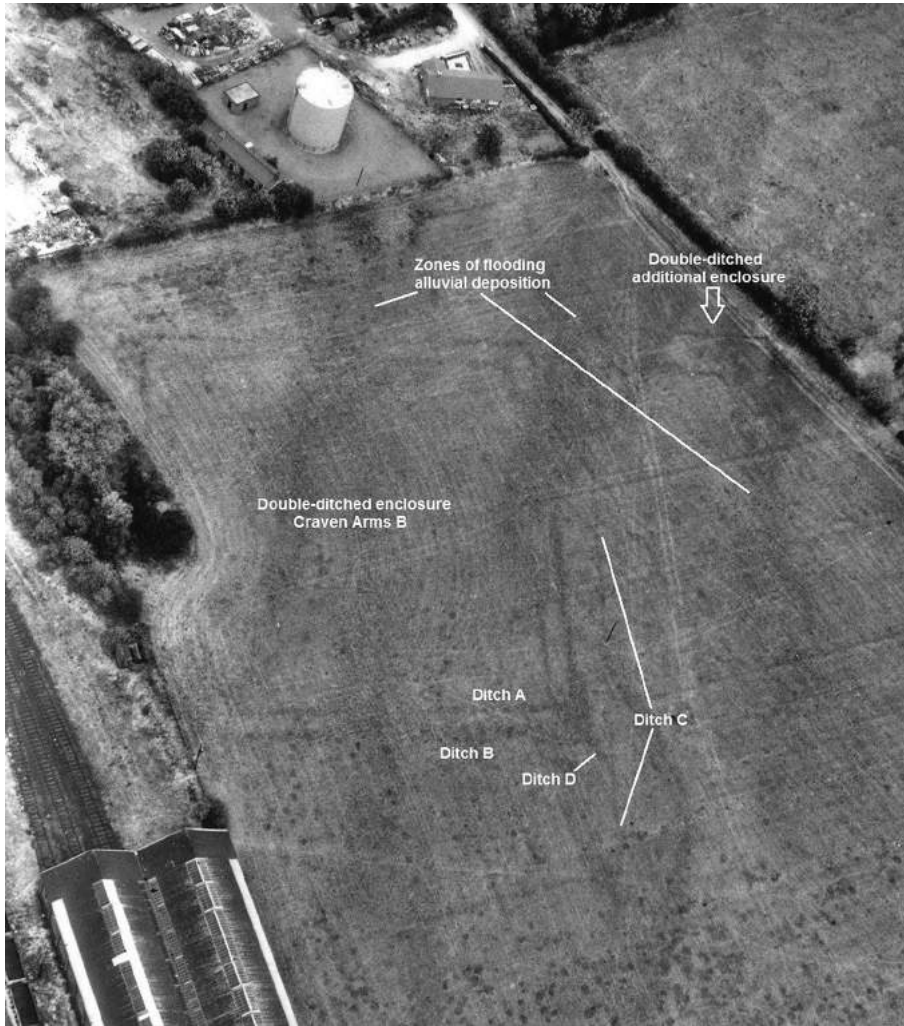


Figure 1. Air photograph looking south showing cropmarks of the Craven Arms B enclosure. By kind permission of Cambridge university Committee for Aerial Photography: photo reference CBF017 taken 28.7.76.

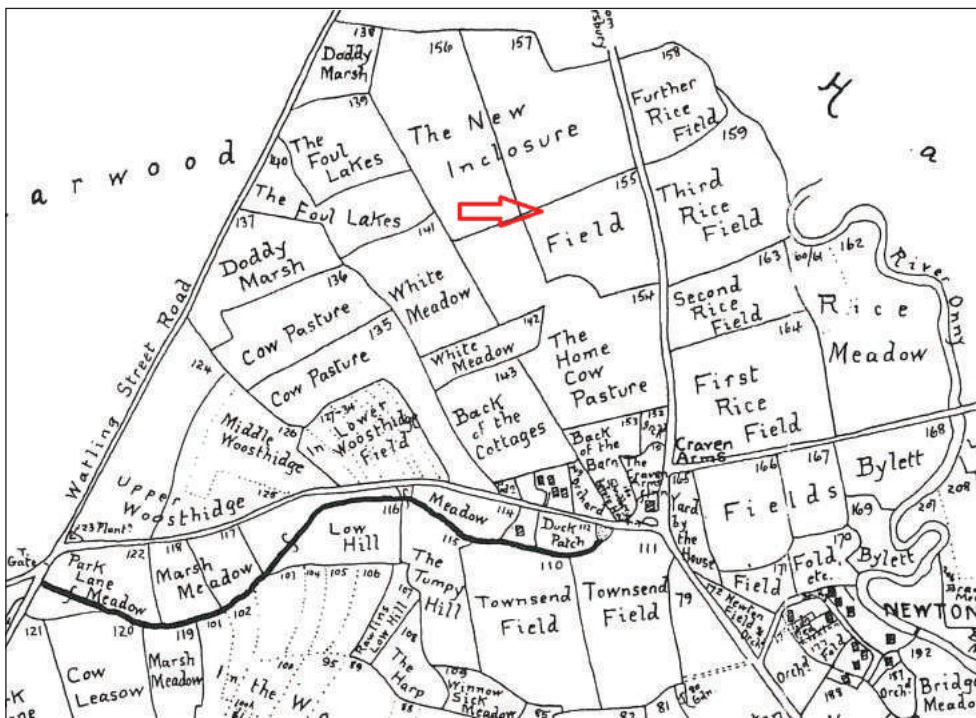


Figure 2. Extract from 1842 tithe map showing location of site. Transcription by H. D. G. Foxall.

excavation of an attenuation pond within Area A, and over the area of new build to the north.¹

The proposed development comprised an extension to the existing Highways Depot totalling 7421m². Most of the development consisted of an extension for a c.80m long parking area, located to the south and west of the existing depot. The footprint of this extension is shown in Colour Plates 2 and 3. A mains electricity cable runs down the central part of the site, and running parallel to this in the east of the central area was a sewage pipe. The site was therefore divided into two parts, Area A to the east of the electrical cable and sewer, (which were left undisturbed) and Area B to the west.

The soils on the site consist of well drained sands and gravels overlying a solid geology of Wenlock Shale. The site is broadly level at 121m above Ordnance Datum (AOD), with the local topography dipping gently to the west/south-west, to 91m AOD on the Roman Road next to Oakfield, which lies approximately 400m from the site's western boundary.

BACKGROUND RESEARCH

The site was originally identified from aerial photographs (Figure 1) and is logged on Shropshire's Historic Environment Record (HER) as PRN 02046 'Rectangular enclosure north of Brook Road (Craven Arms B)'. The original Ordnance Survey entry records the site as lying on a level pasture field with drainage works in the southern part. It describes the site as 'cropmarks of a double ditch with a single ditch meeting them at an oblique angle' at least 50m in length along the north and 60m along the west, with an 8m separation between ditches. A 40m diameter ring ditch is also mentioned as located to the north of the enclosure ditches.

Transcription was undertaken in 1982 and the features interpreted as 'the formal precinct of a small Roman villa'. The plot of the features from the air photograph shows a double-ditched playing-card shaped enclosure, typical of Roman marching camps, and the site is in close proximity to another enclosure interpreted as a Roman camp 300m to the north (PRN 00620). Watling Street Roman road runs south-west/north-east 200m west of the site, on its route from Leintwardine to Wroxeter (see Colour Plate 1).

Two previous investigations have taken place on the site. The first consisted of geophysical prospecting and trial trenching (locations shown in Colour Plate 4) in 1991 by BUFAU (Ferris 1991) which exposed two massive linear disturbances and some internal features. Ten sherds of Romano-British pottery were recovered, but the presence of iron sewage pipes and vandalism to survey points, led to confusion in the recording. In 2004 a watching brief undertaken by BUFAU during previous development at the Highways Depot just north of the

enclosure, did not find any evidence for archaeological activity (Krawiec 2004).

Historic mapping for the area includes the Tithe Apportionments map for Stokesley c.1840 – prior to construction of the railway – (transcribed by H. D. G. Foxall in the 1970s). This places the site in a group of three fields (numbered 155–157) which are called The New Inclosure Field (Figure 2). To the west four fields between New Inclosure Field (156) and Watling Street Road are called Doddy Marsh and The Foul Lakes (numbered 137–140), showing the generally wet and unpleasant nature of the land, whilst to the south and south-west of the site the fields are named as pasture and meadow land. The eastern edge of New Inclosure Field is formed by the Shrewsbury road, and the northern side forms the parish boundary.

The 1st edition Ordnance Survey (OS) 25 inch map of 1885 shows the site lying within what was called 'The New Inclosure Field', but now without sub-divisions, and with the railway cutting through the north-east corner. In the south-eastern corner an area of marshy ground and a pond is shown, and south of the field a gas works had been built.

By 1975 the 1:2500 scale OS map showed encroachment from the railway along the eastern edge of the field (Figure 3), and expansion of the built-up area of Craven Arms south-west of the site, although the gas works buildings were still extant due south. By 1999 aerial photography showed that the gas works had been built upon for further residential development, and the northern end of the New Inclosure Field had been developed as the initial phase of the business park. By 2009 aerial photography showed that the railway sheds to the east had been demolished, and that the Business Park had expanded south to form the existing arrangement.

By 2013 a small area of grassland remained with a west-east double hedge boundary, presumably a plantation for defining the area of the business park. The archaeological cropmark enclosure straddles both sides of this hedge, and the northern ditches lie within the area for extension of the highways depot.

THE 2013 EXCAVATION

Mechanical excavators with toothless ditching buckets were used under supervision of an archaeologist to strip the overburden from the site, stockpiling in the central zone where the services ran (Figure 4), and on rough ground to the north-west. Beneath the topsoil and modern disturbance, the underlying sedimentary deposits were very variable, and interleaved with archaeological activity. Identification of a consistent level from which cut features occurred was not easy to discern, especially in the south-western part of the site where a series of lower levels and test pits were

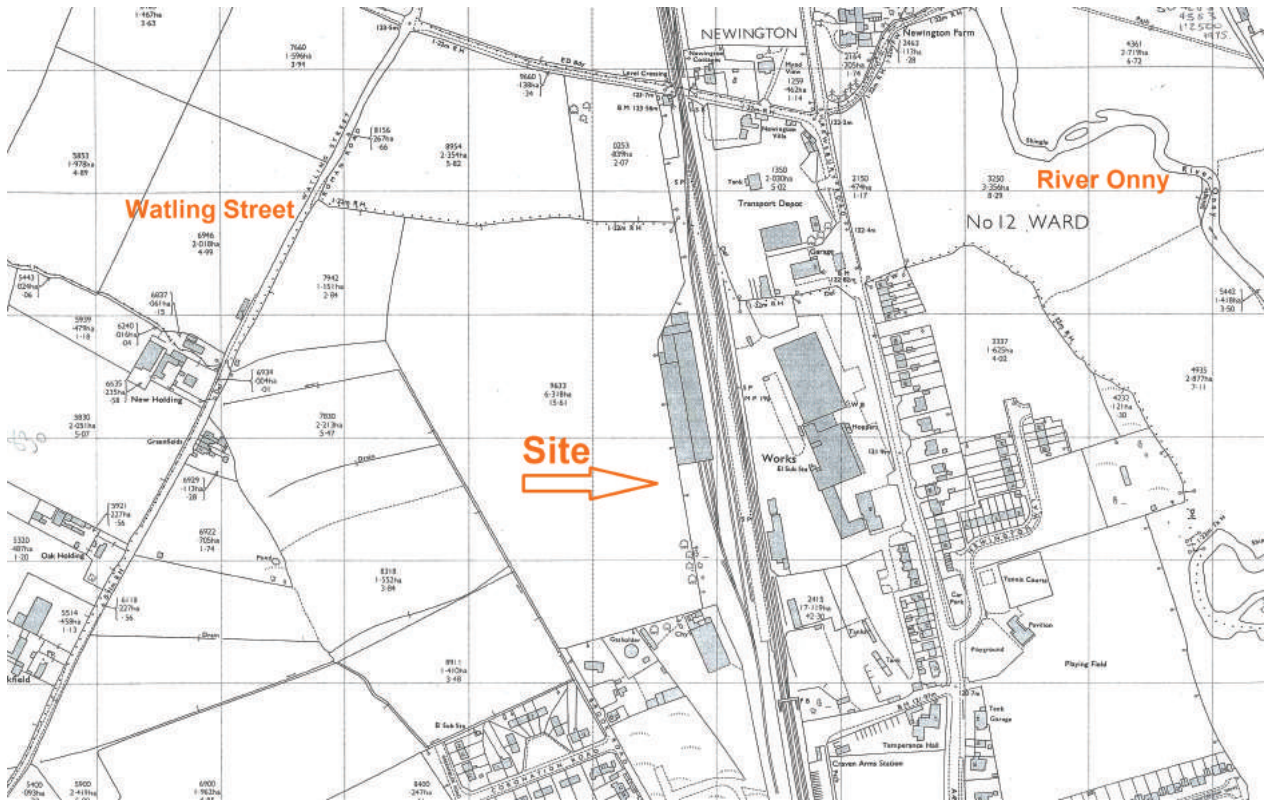


Figure 3. Site location on 1975 OS map.

employed to try and clarify the stratigraphic sequence. This area appeared to have been a zone of lower-lying land prone to flooding, which had eroded and obscured archaeological features and deposits. In addition the time of year in which excavation had to be conducted was far from ideal, with periods of heavy snow, rain, and poor light conditions (Figure 5).

General Stratigraphy

The general stratigraphy of the site consisted of topsoil (12), overlying a subsoil (13), which sealed the Romano-British features over most of the site. All the Romano-British features appeared to cut into natural

deposits of clay sands (2) and gravel (11) which were dated by OSL to 5017–3275BC (OSL sample 9). Natural depositions (2), which consisted of light brown clayey sands similar to (13), were in places overlying Romano-British features, suggesting the accumulation of these sandy clays on the site was an ongoing process, both before and after occupation of the site. The reasons for deposition of this material is unclear, although given the gravelly low-lying nature of the site, and its relative proximity to an area at risk of flooding, it is probable that many of these clays could be alluvial in origin. Underlying the clays were a series of very fine silty gravels (11) that quickly became ‘mud-like’ on exposure



Figure 4. View of site under excavation with Ditches A, B, C and D in foreground and hills to the east beyond.



Figure 5. View of Area B looking south with Goat's Hill in background; note flooding over Ditches A and B.

to water. Cutting through all these deposits within the excavation area were remains of two of BUFAU's evaluation trenches (Trenches 1 and 4 respectively) numbered F9 and F175 in 2013.

Area A displayed evidence of having been landscaped, probably during the construction of the original depot to the immediate north. Topsoil (12) overlaid the remnants of a track, which originally led from the railway stock yard to the northeast and also part of hard standing (91) for the site hut used during the construction of the council depot. Underlying these features was an earlier topsoil (90), although over most of the area the differing levels of topsoil were poorly defined from each other and they no doubt represent re-deposition of the same material. Cutting through topsoil (12) were a number of small test pits, probably relating to geotechnical survey during construction of the depot or in advance of the planning application that has led to this archaeological investigation.

A heavily compacted layer of mid-reddish brown silty clay (115) was located in the northern quadrant of the site, within which were occasional flecks of charcoal, daub and small heavily eroded pieces of ceramic. It is notable the daub and charcoal deposits were not prevalent over the Romano-British features elsewhere.

In Area B waterlogging and bad weather made excavation difficult, and in the end it was decided that due to the depth of some of the archaeological features, which made them unlikely to be damaged by the car park construction, and the difficulties in excavating them, that some parts of this area should be left un-investigated or not fully excavated. They remain preserved beneath the new car park.²

Over the majority of Area B topsoil (12) overlaid subsoil (13), which overlaid what appeared to be a natural accumulation of silty clays (176). The majority of features were cut into natural gravels (11) below this layer, although in certain parts of this area low points in the natural gravels appear to have been filled by natural sediments of probable alluvial origin. Like Area A, this material appears to have been deposited mainly before the human activity on the site, although in several areas, notably the south-western corner of Area B, overlying the main enclosure ditch, there appeared to have been a later phase of deposition represented by (176), indicating later accumulation of natural origin.

Phasing

The phased plan of the site is shown in Colour Plate 4. This shows all features and main deposits, and has been colour-coded to show the various phases, given approximate periods by pottery evidence, and scientific dating. Slot sections are also illustrated to assist in cross-referencing the section drawings illustrated below. Where sequential deposition has not allowed direct stratigraphic relationships, the phasing has been based on dating evidence, or spatial relationships and

morphology of features to assign them to a phase. This has provided a best fit to help with interpretation of the site. To avoid multiple context numbers for the same feature which were given during excavation for different slots through these features, during post-excavation analysis master descriptions and letters have been assigned (e.g. Ditch B for the outer enclosure ditch). The details of the different context numbers within master features are listed in Table 1 (pages 64 and 65), and the general layout of the site is shown in Colour Plate 4, with detailed plots of Area A and Area B shown as Colour Plates 4a and 4b.

CHRONOLOGICAL ANALYSIS OF THE ARCHAEOLOGICAL EVIDENCE³

Phase 1

Prehistoric: represented by residual pottery, an oven, the first phase of the cropmark enclosure (inner cut F84 (Ditch A) and outer cut F127/11016 (Ditch B)) and a V-shaped ditch located west of the enclosure, cut F6 (Ditch C).

Phase 1.1

Ditch A: cut F84 and use as enclosure ditch

Ditch B: cut F127/11016 and use as enclosure ditch

Ditch C: cut F6/21/23/25/006 (base) and use as ditch

Oven 3: charcoal-filled pit F11010 and primary use. Fired clay base and side 11009, charcoal-rich basal fill from use of pit 11008

Phase 1.2

Ditch A: fills 82, 83, 131

Ditch B: fills 58, 59, 124, 136, 140, 141, 142, 143, 11011, 11012, 11013, 11014, 11015

Ditch C: fills 5, 20, 24, 102, 105

Oven 3: F11010, upper fill 11007

Description

Ditch A. This phase includes a series of construction activities associated with a rectilinear enclosure visible as a double-ditched cropmark in aerial photographs. The inner ditch (Ditch A) was traced for a short distance within the southern edge of Area B, with a 5m length of its northern side exposed, extending from the east to the enclosure's north-western corner. It was investigated by two hand-dug slots which revealed two sandy-silt infill deposits, a compacted primary fill (83), and a looser secondary fill (82) which contained prehistoric pottery, and a single sherd of (intrusive) Roman pottery. The ditch was V-shaped and wider than 1.2m, surviving to a depth of 0.52m cut into the natural geology (Figures 6 and 7 and Colour Plate 4b).

Ditch B. The outer enclosure ditch (Ditch B) also originated in this phase. The earliest part of this ditch consisted of a gently sloping, wide-based feature approximately 1.4m wide at the top, and cut up to 0.5m deep into the natural geology. Slot 1 shows that the full sequence from present ground level to the base of the Phase 1 ditch was 1.2m (Figure 8 and Colour Plate 5).

This initial phase of outer enclosure ditch was only found in the base of excavated slots taken through its later phases, which was exposed for a length of 12m east–west, and 4m south–north in Area B. Five hand-dug sections investigated Ditch B, with up to five infill episodes recorded for Phase 1 comprising sandy-silt-clays with variable amounts of gravel content included within each infill episode, probably reflecting different erosion or flooding events and a relatively extended

period whilst the open ditch accumulated these various deposits. From one of the primary fills (58) a sample was taken for OSL dating, which gave a date of BC 296–244 AD. A further partial investigation occurred in the extension to Area A during the watching brief, when the later phase of this ditch was excavated by means of a slot cut across it which revealed that it cut an earlier ditch beneath on a slightly different alignment.

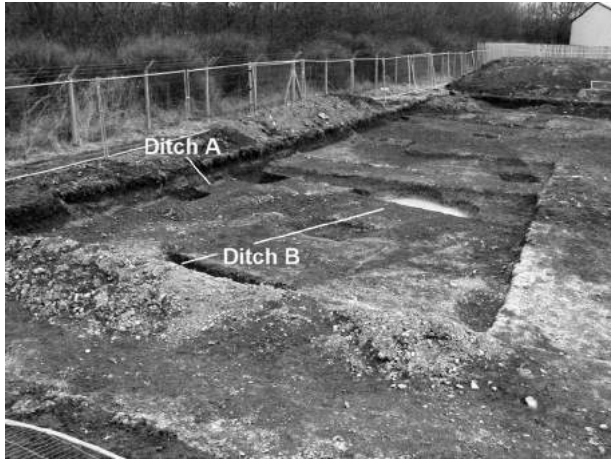


Figure 6. Area B: Ditches A and B looking west.

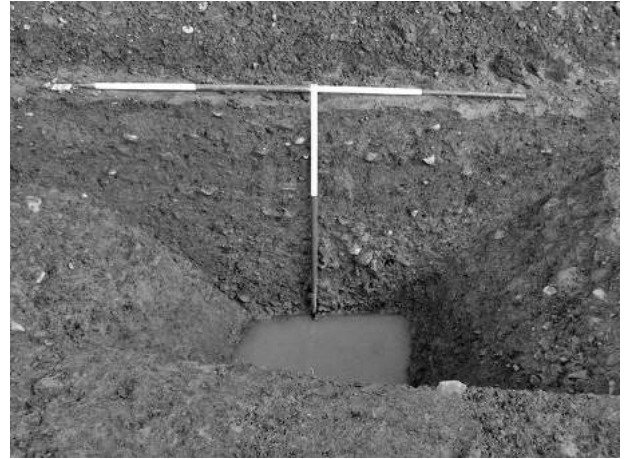


Figure 8. Ditch B slot 4 looking east.



Figure 7. Ditch A looking west.



Figure 9. Ditch B slot 1 looking south.



Figure 10. Ditch C slot 1 looking south.

Ditch C. A third ditch was also constructed in this phase, oriented north–south 4m west of the outer enclosure ditch and extending the full width of Area B for a length of 24m, but continuing beyond the excavation area to south and north (Figures 4 and 22 and Colour Plate 4b). The southern part of this ditch was well preserved, whilst the northern section had been altered by a later ditch which cut into it and followed its alignment northwards. Ditch C was recorded in seven hand-dug slots as a V-shaped construction-cut, 0.45–0.8m wide and up to 0.5m deep (Figure 10), growing shallower towards the north. Prehistoric pottery and a piece of fired clay was found within the fill at (5) and (102) which was a sandy silt with charcoal and small pebble inclusions (Figure 11). A single sherd of samian was found as intrusive within the top of the fill at (20).

Oven 3. An oval pit F11010 in Area A had been cut into the natural geology to a depth of 0.27m, 1.7m east–west and more than 0.9m north–south (Colour Plates 4a and 6). This was filled by a primary deposit of charcoal, 0.6m thick (11008), and a silty clay capping layer 0.2m thick (11007). The base of the pit had been subject to heat which had left a 20mm thick orange-red clay lining (11009). No finds were recovered. The southern part of the infilled pit was destroyed when the Phase 2 enclosure ditch was cut demonstrating its association with the earliest phase of activity.

Interpretation and Discussion of Phase 1

Enclosure. This phase of activity has been assigned for the initial construction of a double-ditched enclosure which is represented by two parallel ditches running east–west, and their return to the south-west, to form the north-western corner of the enclosure. The surviving basal parts of these ditches were up to 1.4m wide and 0.5m deep, with the inner ditch V-shaped, whilst the outer ditch displayed a less pronounced profile. The ditches were set approximately 3m apart, presumably sufficient area for a small bank to have been formed from the upcast from the outer ditch, but there was no archaeological evidence for a bank. The phasing and relative association for the first phase of the two enclosure ditches is based on prehistoric pottery from the inner ditch fill, and an OSL date from the outer ditch fill. This does not provide definitive evidence for contemporaneity, and the possibility that the two ditches were in fact separated by a number of years, perhaps even a generation, cannot be discounted, but for the purposes of simplicity in his report the assumption has been made that the two ditches formed a single type of feature, a double ditched enclosure.

Palisade. To the west of the enclosure a much narrower V-shaped ditch had been aligned on a north–south axis, bisecting Area B. Within the short space visible within the excavation area, this ditch appeared to run parallel to the western side of the enclosure at a distance of 4m from it. The surviving profile was relatively sharp and suggests that erosion of the ditch sides and base had not occurred in antiquity. The function was clearly not one of drainage as evidenced by the lack of erosion, and that therefore the ditch had been rapidly backfilled after opening. It is therefore interpreted as the trench foundation for a palisade, and the ratio for how deep a post needs to be set in the ground is approximately the height of the post above ground divided by three. Calculating in reverse for the 0.5m-deep trench foundation represented by Ditch C

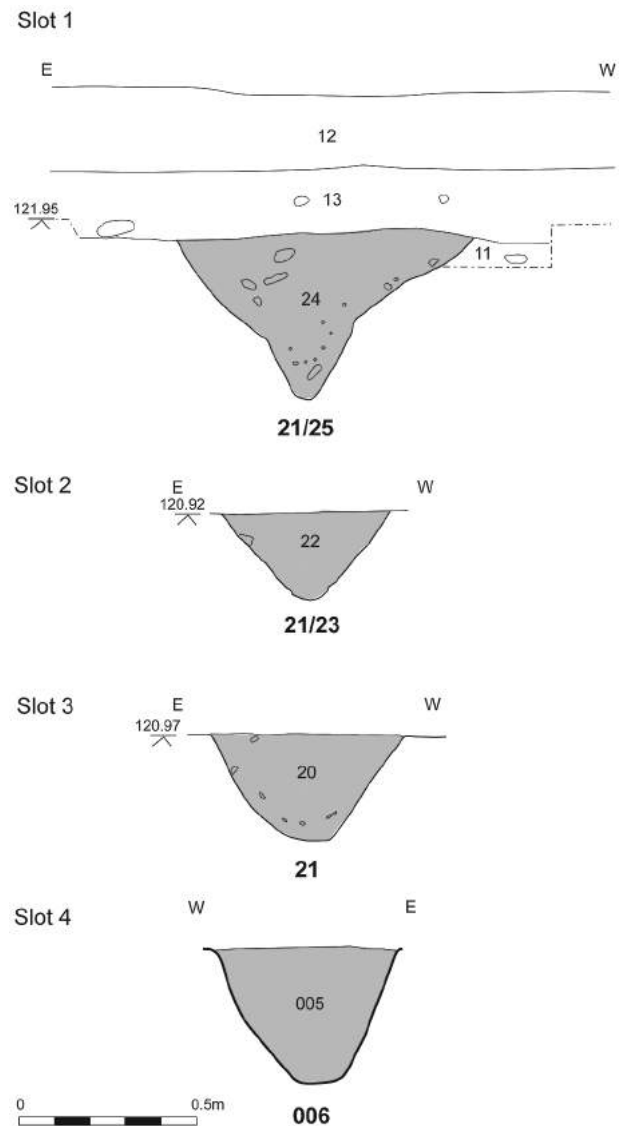


Figure 11. Ditch C section drawings of excavated slots south–north.

would allow an assumption that the palisade would have been at least 1.5m high. As contemporary ground level, however, would have been higher than the surviving top of the feature as found cut into natural geology (because the contemporary subsoil and topsoil have been eroded or ploughed away), then an additional 300mm of ploughsoil could be added above the surviving top of the ditch, which would suggest that the palisade could have been 2.4m high.

Oven. The pit found in Area A was clearly subjected to heat in order to form the hard red clay lining. The primary fill consisted of charcoal, which is interpreted as representing the residue from use as a fire-pit. The upper fill appears to have been deliberate backfill sealing the charcoal inside the pit, and the assumption is that this was relatively short-lived oven, the purpose which cannot be determined from the archaeological evidence available. The location is of interest, however, as it lay immediately outside of the enclosure, but was cut through when the outer enclosure ditch was realigned during Phase 2. The expectation would be that such activity would have been more appropriate within the enclosure, if the latter was

designed with a domestic or farmstead function, rather than external to it. Ovens are frequently recorded as having been constructed into the banks from evidence gathered during excavation of other enclosures in Shropshire, but this would seem unlikely in this instance.

Phase 2

Early Roman: represented by 1st century AD evidence including second phase of Ditch B.

Ditch B: F26/125/128/11006 representing a recut of Ditch 127/11016

Description

The evidence for this phase comes from the outer enclosure ditch in both Areas A and B. It comprises a recut along a slightly different alignment from the first phase of the ditch, so that the recut was located internally at the western end, but then crossed the first phase and diverged from it externally towards the east. The recut was very similar in dimension and form, consisting of a gently sloping wide U-shaped profile, but in two sections where the first phase and the recut follow the same alignment, it can be seen that the second phase was not cut to the full depth of Phase 1 (shown as an orange line on the section drawings on Colour Plate 5). The ditch was approximately 2m wide at the top and up to c.0.5m deep. Within Area A an investigation through Ditch B was undertaken by excavation of Slot 5, in the section of which Phase 2 of Ditch B can be seen cutting the infilled Phase 1 ditch.

Interpretation and Discussion of Phase 2

The phase is characterized by re-establishment of the outer enclosure ditch after a long period when the original ditch had become infilled. The alignment chosen for the recut did not follow the exact line of the previous ditch, but instead was cut on the inside at the western end and then gradually migrated slightly to the north (outside) of the Phase 1 ditch at its eastern end. The profile and dimensions appear similar to Phase 1.

Ditch C went out of use as a stockade/palisade before or during this phase. No evidence for destruction such as burning or physical removal of posts was recorded.

Phase 3

Roman: represented by 1st to 2nd century AD evidence including infill of Ditch B cropmark enclosure outer ditch. Contemporary with this phase is Ditch D F8/14, and a number of discrete features: Ovens F53/77 and F10006, vertical-sided, short-length trenches F31, F44, and F69, F10001 and F10003, and a pit F38. The trench features would appear to indicate a structural element due to the depth and un-eroded vertical sides of the features.

Ditch B: infill episodes 27, 57, 123, 134, 137, 138, 11004, 11005 of enclosure ditch

Ditch D: F8/14/106 and primary use of ditch, infill episodes 19, 101, 104, 110, 111, 149

Structures 1 and 2, F31, F44, F69, F10001, and F10003 infill 30, 32, 33, 43, 45, 68, 73

Oven 1: F92 (and stoke-pit F77), clay lining 53, and evidence of usage: fills 52, 53, 64, 74, 75, 76

Oven 2: F10006, and evidence of usage: fill 10011

Pit 38: backfill 37

Description

Phase 3 is assigned to describe an increase in activity in both Areas A and B. The evidence for this activity survives in the form of two ovens and some structural elements in Area A, and within Area B by infill of the Phase 2 outer enclosure ditch, as well as construction of Ditch D.

Oven 1 survived as a well-preserved, clay-lined trough F92 with fire pit and stoke-hole F77 at its southern end. The oven



Figure 12. Oven 1 looking north-west.



Figure 13. Oven 1 detail of southern end with stoke-hole and rake-out pit.



Figure 14. Oven 1 looking south-east.

was 1.8m in length, 0.6m wide externally, and up to 0.4m in depth. The main body of the oven had an elongated shape, filling a vertical sided cut F92 in the ground. The sides of the oven comprised a differentially fired orange clay lining (53), which was 0.10m thick and 0.20m in height (Figure 12, Colour Plates 4a, 7 and 8). This material contained some larger upright stones, which appeared to form an integral part to the lining of the oven. The colour differentiation on the clay lining reveals how intense the heat was for different parts of the structure, with the red areas having been exposed to greater temperature over a longer duration than the brown clay. The purple area at the top of the north-western end of the oven probably denotes the highest heat, whereas the grey areas along the lower parts of the structure (especially along the western wall) suggest lowest temperatures. The colours would suggest that during operation the heated air circulated along the eastern side and then up and out at the north-western end. The narrow opening next to the stoke-pit might have allowed air intake which lessened the heat along the western wall (Figure 13).

Filling the oven were a series of collapse deposits, the latest of which comprised of a firm dark brown silty clay, with inclusions of yellow clay, occasional angular stones and burnt clay, and moderate amounts of charcoal flecks (52). This material overlay a mixture of clay with some larger stones, which probably represents the collapse of the oven roof (63). The basal fill of the oven comprised of 60% charcoal flecks and fragments, mixed with brown silty clay with sand and burnt clay inclusions (64) (Colour Plate 9). This was probably the residue from the final firing of the oven.

To the south of the main oven body was an irregular cut F77 that formed a fire pit and stoke-hole area measuring 0.85m in diameter and 0.10m in depth. Filling this cut there was a series of flat, angular stones forming a rough surface or collapse material (75) which overlay a dark grey brown silty clay with charcoal flecks and fragments, attributed to leftover firing material (076) (Figure 14). Overlying the stones (075) was a dark brown silty clay with some charcoal inclusions and occasional burnt clay (74). This material could represent material raked out from the oven.

Bulk samples 5, 6 and 7 for palaeoenvironmental analysis and radiocarbon dating were taken from the fills of Oven 1, while samples 11, 12 and 13 were taken from the fills of the stoke-pit F77 adjacent to this feature. Detailed results are contained in the specialist report (see Mooney below), but the majority of charred material in sample 7 could be identified as either barley or wheat, such as six-rowed barley and emmer wheat, although bread wheat may also be represented in the assemblage. Oat and brome were also identified, as well as some other wild species, but chaff or other evidence for cereal processing was very rare. The wood charcoal included a range of different species, but was dominated by cherry/blackthorn and oak.

Two samples were taken from the fired-clay wall material for OSL dating, and these provided dates of 206 BC–AD 154, and 56 BC–AD 224. Samples were also taken of the charcoal from the infill deposit, and these gave 22–130 cal AD (SUERC-53994) and 73–225 cal AD (SUERC-53995) from within the oven, and a date of 56–215 cal AD (SUERC-53998) from the stoke-hole. The overlap between these dates suggests construction and use of the oven occurred during the 1st to 2nd centuries AD, and Bayesian modelling of the available data shows that for the oven a period of about 50 years between

the late 1st and early 2nd century can be assigned for when it might have operated.

Oven 2 was less well preserved than Oven 1, and had evidently suffered greater damage from later activity. It comprised a reasonably solid southern side of burnt/heated clay, while the central and northern halves were fragmentary and in-filled with stone and burnt clay sides of the oven (10011) (Figure 15). The oven was contained in a roughly elliptical cut F10006, which had been eroded by later activity, while the base of the cut was slightly concave in profile.



Figure 15. Oven 2 surviving remains of clay walls and infill.

Structure 1 To the south-east of Oven 1 were two short linear trenches, F31 and F69 orientated approximately east–west (Figure 16 and Colour Plate 4a). The earlier of the two, F69, was 4.8m long by 0.53m wide and 0.4m deep. The construction cut was slightly curved in plan, with steeply-sloping, at times vertical, sides, and a flat base. Running almost parallel on its northern side 0.5–1.5m away there was a second, similar structural feature F31. This was 4.6m long by 0.6m wide, with a north–south arm which measured 2.7m in length connecting it to feature F69. Cut F31 was therefore roughly L-shaped in plan with vertical sides and a relatively flat base, extending to a depth of 0.5–0.7m. These trenches were filled by a friable reddish-grey-brown clayey silt with



Figure 16. Structure 1 looking east showing deep foundation trenches.

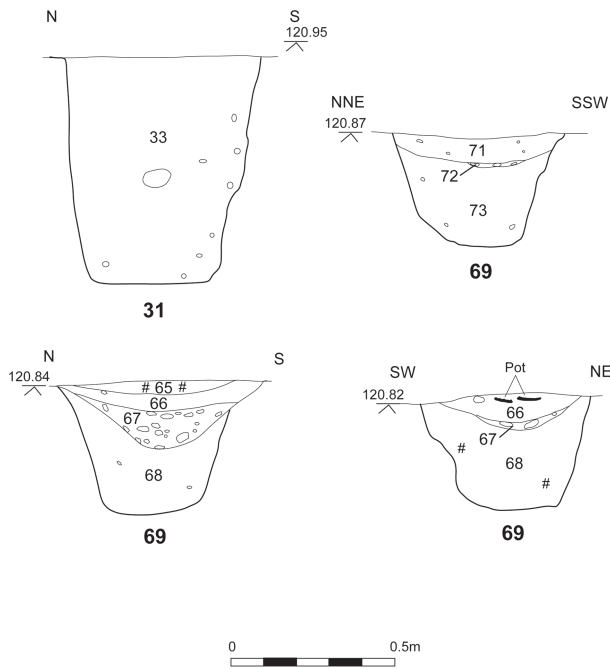


Figure 17. Structure 1 section drawings of excavated slots.

occasional charcoal and burnt clay inclusions (30), (32), (33), (68) and (73) (Figure 17). Artefactual evidence included pottery from (68) and eight sherds of amphorae, and a samian sherd from (73). There were also as seven pieces of fired clay

from (73) and one piece of fired clay from (33) – significantly more daub than found at any other feature on site.

Structure 2. Lying adjacent, and to the south-east of Oven 2 was a large deep pit F44, that was sub-rectangular in shape with near-vertical sides. The pit was oriented north–south, c.3.0 long by 1.0m wide, and up to 1.25m in depth at the southern end, but sloping up to 0.6m in depth towards the north (Figures 18 and 19). Within the pit there were a series of fills, of which the earliest was a compact mid-grey brown sandy clay with occasional charcoal flecks (42), (43), (45). Second century Severn Valley ware was found in (42) and (43), and Black-burnished ware in (42). Two samples were taken from the primary fill (43) for OSL dating. The results were 306 BC–AD 134 and 326 BC–AD 54 (Figure 19).

In addition to the pit, two shallow ditches comprised a reasonably substantial foundation trench, forming an L shape (Figure 20 and Colour Plate 4a). The function of this foundation trench was probably for a timber structure which ran parallel and perpendicular to pit F44 as an L-shaped trench aligned for 7m north–south, and 9m east–west, with the corner to the south-east. The trench was constructed with steep sides and a flat base, up to 0.5m wide and 0.15–0.3m deep on its north–south arm, and 0.4m deep on its east–west arm (Figure 21). The distance from Pit 44 to cut F10001 was 2.4m, and from the southern end of Pit 44 to the east–west arm cut F10003 was 4m.

Pit F38 was located 2m south-east of pit F44 and lay between the eastern and southern wall lines created by gullies

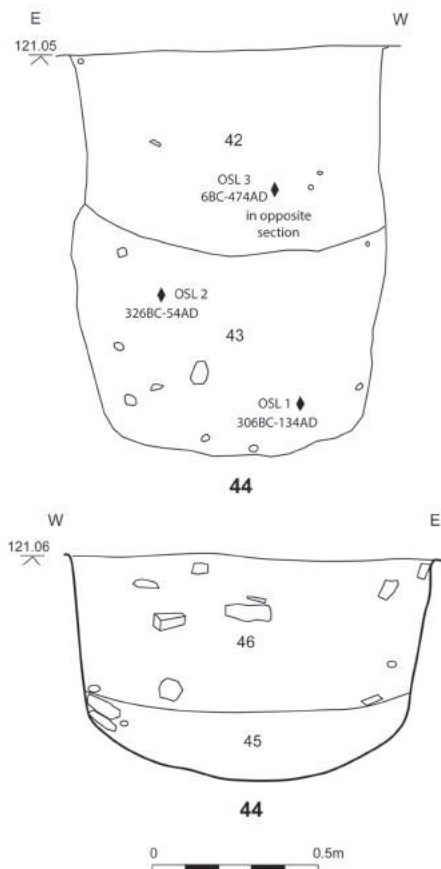


Figure 18. Structure 2 pit 44 section drawings and photograph of excavated slot looking north.



Figure 19. Structure 2 pit 44 looking south with OSL sampling in process.



Figure 20. Structure 2 aerial view looking south showing all foundations of structure with excavated slots through the gullies and pit.

F10001 and F10003. It consisted of an oval cut with gradually sloping sides into the natural geology, which was 1.8m long north-south, 0.45m wide, and 0.12m deep. This was filled by a reddish brown sandy clay with stones and charcoal in it.

Ditch B infill deposition episodes. The infill episodes that comprise Phase 3 consisted of two discrete but similar deposits of silty-clay with a large proportion of stone, gravel and charcoal inclusions. The maximum depth of these infill

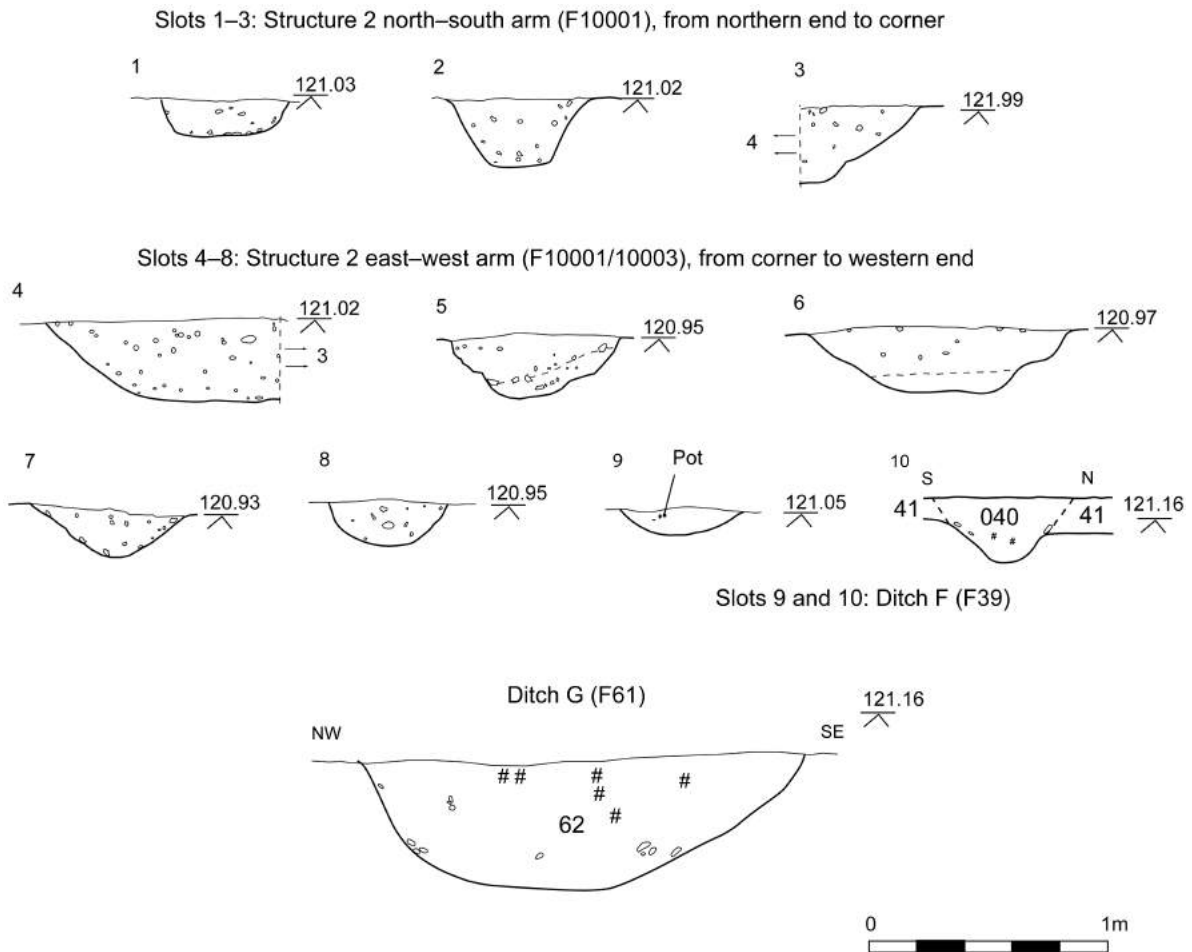


Figure 21. Section drawings of excavated slots through various ditches and gullies.

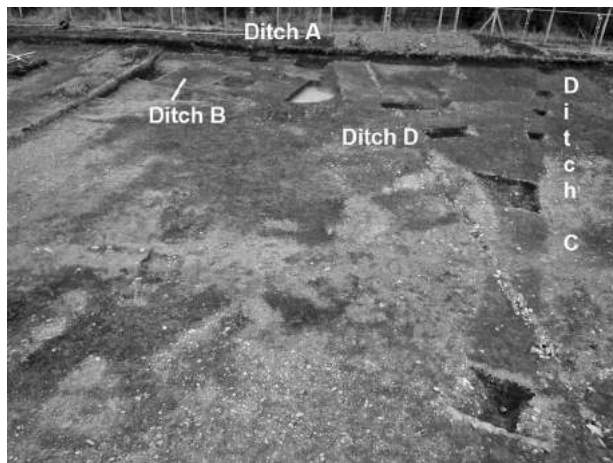


Figure 22. Area B aerial view looking south showing Ditches A, B, C and D.



Figure 23. Ditches C and D junction, slot 3, looking south.

episodes extended to 0.8m. Within the upper layer (27) second-century amphora and second-century Severn Valley ware were found as well as residual prehistoric pottery, whilst further Severn Valley ware was found in the primary fill and upper deposit in Area A (11005) and (11004).

Ditch D construction and primary use. A U-shaped ditch was cut during this phase, which spanned Area B from north-south in a curving alignment for *c.*24m. From the north, Ditch D was partially cut into, and followed the same alignment as, Ditch C, but after *c.*8m it began to diverge from the straight orientation of Ditch C (Figures 22, 23 and Colour Plate 4b.). From this point it was cut into the natural geology towards the north-western corner of the enclosure becoming wider and deeper, cutting across Ditch B, and cutting into Ditch A at the southern edge of Area B. The ditch was 1.2m wide and up to 0.5m deep with sharply sloping sides.

The primary fill for Ditch D comprised a sandy silt with a high percentage of small stones and gravel. Several of the excavated sections show this deposit slumping in to the ditch from the east, strongly suggestive that the primary infill derived from erosion of a bank on the eastern side of Ditch D (Colour Plate 10).

Interpretation and Discussion of Phase 3

The evidence for this phase shows that corn drying was probably undertaken on site for a short period in the late 1st or early 2nd century AD. The palaeoenvironmental analysis suggests that fuel wood including brushwood from woodland, hedgerow and scrub environments was used in Oven 1, which also contained remains of fully processed wheat and barley. This feature may have been used for a variety of purposes, including the drying of cereal grains prior to storage, bread making or other (industrial) activities. The evidence for grain could indicate the burning of cereal waste together with other fuel, but the most likely interpretation is that the function is that of a corn dryer, and by implication this has also been attributed to Oven 2. The variable heat intensity within the oven suggested by the colour differentiation and fired clay lining did not include evidence for vitrification or very high temperatures. It is therefore possible that the fire lay outside the oven (in fire pit F77) and the heat from this was conveyed through the oven by means of the stoke-hole.

In addition to the ovens constructed for corn drying, several short trench-like features were found which are interpreted as of a structural nature, perhaps foundation cuts for containing large timber uprights. The vertical sides and flat bases to these features demonstrate that they were not left exposed to erosion, and their narrow, well-formed design suggests their function was not that of quarry pits. The association of these features with ovens might indicate that the function of these structures was for grain storage, with the timber uprights supporting a suspended floor and superstructure and thus their primary infill is interpreted as deliberate backfill to pack around posts. The linear arrangements of these structures and ovens suggest a reasonable degree of regularity in layout of the site, indicating a carefully planned element.

A pit found in close proximity to Structure 2 and Oven 2, with the same orientation as Structure 2 and Oven 1, was probably excavated for a function which was associated with this other activity. Charcoal within the fill could have derived from waste from use of the oven.

The outer enclosure ditch which had been constructed during Phase 2 began to accumulate infill deposits during Phase 3. The silty clay and gravel material suggest natural causes rather than dumping or deliberate backfill, although within the deposit evidence of activity (possibly from the enclosure itself but more probably from external sources) included residual and contemporary pottery and charcoal. The depth of the deposit probably represents a long period of gradual infill. This was the only phase in which artefactual evidence was found in the outer enclosure Ditch B, until its final phase and termination of use in Phase 5.

Ditch D represents a change to the land division external to the enclosure, but linked directly to it. The ditch partially replaces the earlier Ditch C in the northern part of the excavated area, but instead of being aligned parallel to the enclosure, Ditch D was constructed to cut the outer enclosure ditch (Ditch B) and meet with Ditch A at its north-western corner. As this junction occurs at the limit of excavation, it is not possible to say whether Ditch D continued into the interior of what had previously been an enclosed area, but this would seem a likely hypothesis. The primary infill was very stony and appeared to originate from the east, which is interpreted as indicating a small bank would have run along the eastern side of the ditch. Its function may have been for drainage, allowing water to flow

southwards, and/or it demarcated different zones of external activity, perhaps related to the use of the land to the east for ovens and structures, while to the west lay a more open area.

Phase 4

Roman: represented by 2nd to 3rd century AD evidence and mainly consisting of ditches and gullies on alignments broadly parallel to the enclosure ditch, such as Ditches E and F (gullies F4 at the eastern end of the site and F29/39 further west), F10001 and F10003 – two ditches set at right-angles to each other located between F4 and F39 associated with compacted surfaces 115 and 10005, and gully F11002 west of Oven 1. Infill of Ditch D is also indicated, and a final recut in the top of the ditch infill similar in profile and matrix to curving ditch terminal F61. It is probable that the ovens and structural trenches were decommissioned by this point and were backfilled to level the area.

Ditch B: recut F126 and infill episodes 55, 56, 135, 11003

Ditch D: secondary infill episodes 7, 16, 17, 18, 99, 100, 103, 107, 108, 109, 129, 148

Ditch E: F4, infill 3

Ditch F: F29, F39, infill 28, 34, 40

Ditch G: F61

Ditch 11002: F11002, infill 11001

Structures 1 and 2: infill, 42, 46, 65, 66, 67, 70, 71, 72, 10002, 10004, 10008

Compacted surfaces: 115, 10005

Description

Phase 4 records the changing nature of the site during Roman times as a continuation from Phase 3. The evidence includes additional construction activities with new gullies and recut ditches, as well as a series of infill episodes.

Ditch B. The infilled outer enclosure ditch constructed during Phases 1 and 2 was redefined by a recut F126 into the infill deposits. It was identified by excavation in two locations over an 8m length within Area B (Figure 24 and Colour Plate 5 slots 3 and 4). The new construction cut consisted of a very wide and shallow ditch feature, 3.2–4m wide by 0.3–0.5m deep, with a rounded ditch terminal at the western end which left a gap of c.2.5m between this and Ditch D. Where the two earlier phases of the enclosure had been separate but converging features, the new ditch construction embraced the width of both previous ditches. This phase was not identified in Area A further east.



Figure 24. Ditch B looking north-east.

During its period of use the ditch gradually filled with an orange-brown silty clay, with some gravel but few other inclusions or artefacts. An earlier and a later infill episode was identified in Slot 4, and from the earlier infill episode (56) a sample for OSL dating was taken. This provided a date range of 124–444 AD for the period when this episode of infill deposition occurred.

Ditch D. The upper fills of Ditch D comprised a sandy silt with lenses of stones and gravel, occasional charcoal and burnt clay (Colour Plate 9). In addition a relatively large assemblage of pottery for the site was recovered from these fills, consisting of second-century Severn Valley ware.

Ditches E and F. Ditch (or gully) E was traced for 6.6m from the eastern limit of Area A westwards to a point at which it had been removed by one of BUFAU's trial trenches in 1991. Unfortunately the relatively ephemeral nature of this feature was not recognized or recorded at that time. The gully was U-shaped in profile, 0.5m wide and 0.12m deep (Figure 21 and Colour Plate 4a).

On the same alignment but separated from Ditch E by a gap of some 7m without evidence for the gully, the terminus of a similar feature was found: Ditch F extended in a westerly orientation from this terminal for 16m. This gully also had a U-shaped profile, and was 0.5m wide, with a depth of 0.2–0.3m.

The alignment of these two gullies runs parallel to the outer enclosure ditch (Ditch B), 22m to the south. Ditch E curved slightly northwards at its eastern end, and Ditch F appeared to have a slight curve to the north just where it disappeared into the northern edge of the excavation area.

The infill deposit within these gullies comprised a red-brown sandy clay with some stones, and a very large assemblage of second-century Severn Valley ware for such a slight feature, especially compared to the quantities found elsewhere on the site.

Ditch 11002. An ephemeral linear feature that ran in a westerly direction for c.4m. It was located 3m west of Oven 1 and comprised a concave profile, 0.24m wide and 0.08m deep. It was infilled by a silty clay (11001).

Ditch G. This curving ditch was traced for a length of 2.7m from the eastern edge of Area B to its terminal c.2m north of the outer enclosure ditch, Ditch B. It had a U-shaped profile, 0.85m wide and 0.25m deep (Figure 21). The ditch must have continued in a north-easterly direction, but this area lay within a zone that could not be excavated safely because of modern services that ran through the site.

Structure 1. The upper fills within features F31 and F69 comprised a stony deposit (67)/(72) with a sandy silt above (66)/(71) and reddish-brown silty clay with charcoal, frequent burnt clay and a greyish-white clay (65)/(70) (Figure 17). Pottery from the secondary infill (66) included Severn Valley ware, an amphora fragment, and late 1st to early 2nd century samian. A relatively large assemblage of Severn Valley ware dated to the 2nd century, was found within deposit (70). Two charcoal samples were also taken from this secondary infill deposit (70) and these gave dates of 86–239 cal AD (SUERC-53996), and 75–225 cal AD (SUERC-53997).

Table 1. Ditch dimensions and fills.

Ditch A			
Phase 1 cut: F84			
Dimensions: Phase 1: 1.2m wide x 0.52m deep			
Sequence	Phase	Cut	Description
Basal Fill	1	84	loose grey orange brown sandy silt
Secondary Fills		84	firm brown sandy silt
		131	firm grey brown sandy silty clay
Inclusions			
occasional angular and sub angular pebbles			
sub-angular pebbles			
occasional gravel, pebbles and charcoal flecks			
Dating evidence			
4 sherds of prehistoric pottery			
1 sherd of Roman pottery			
Ditch B			
Phase 1 cuts: F127/F11016; Phase 2 cuts: F26/F125/F128/F11006; Phase 4 cut with Phase 5 upper fill: F126			
Dimensions: Phase 1: 1.6m wide x 0.5m deep; Phase 2: 1.3m–4.8m wide x 0.36m–1.12m deep; Phase 4: 3.2m wide x 0.6m+ deep			
Sequence	Phase	Cut	Description
Basal Fills	1	127	
		127	brown sandy silt clay
		124	firm grey brown silty clay
		143	grey brown sandy silt
		11015	mid grey brown clay silt
Secondary fills		11016	mid grey brown silty sand
		127	mid grey brown silty sand
		136	grey brown sandy clay
		142	grey brown sandy silt
		141	brownish grey sandy clay
		140	sandy clay
Secondary fills		11016	mid reddish brown clay silt
		11013	mid grey brown clay silt
		11012	mid grey silty clay
		11011	mid brown grey silt clay
		26	
Basal Fills	3	26	grey brown silty clay
		125	firm sandy clay
		123	firm sandy clay
		134	sandy clay
Secondary fills		128	grey brown sandy clay
		11006	mid grey brown firm clay silt
		26	grey brown silty clay
		128	grey brown silty clay
Basal Fills	4	11006	mid grey brown clay silt
		126	
		126	mid brown silty clay
Secondary fills		135	firm orange brown silty clay
		55	mid red brown silty clay
		11003	firm mid brown silty clay
Final fills	5	126	red brown silty clay
		126	firm mid grey brown
Inclusions			
very frequent gravel and rounded cobbles			
frequent rounded pebbles, occ small cobbles			
very frequent gravel and rounded cobbles			
frequent rounded pebbles, occasional cobbles			
very frequent sub-rounded pebbles, very occasional pebbles, occasional charcoal and ceramic building material flecks			
very frequent gravel and round cobbles			
very occasional pebbles			
frequent charcoal flecks, occasional sub rounded pebbles			
occasional gravel			
moderate rounded pebbles, occasional cobbles			
moderate gravel			
occasional rounded pebbles, very occasional charcoal flakes			
occasional gravel and sub rounded cobbles			
occasional subrounded pebbles and cobbles and charcoal and burnt clay flecks			
Dating evidence			
1 sherd of prehistoric pottery; 3 sherds of Roman pottery			
OSL 5: 124–444AD (Romano-British 2nd–3rd century AD)			
Ditch C			
Phase 1 cuts: F6/F21/F23/F25			
Dimensions: Phase 1: 0.48–0.84m wide x 0.24–0.46m deep			
Sequence	Phase	Cut	Description
Basal Fills	1	6	brown red clay silt
		5	
		20	friable mid red brown sandy silt
		21	friable mid red brown sandy silt
		22	friable mid red brown sandy silt
		24	friable mid red brown sandy silt
Secondary fills		102	mid reddish brown sandy silty clay
		6	mid grey brown silty clay
		105	mid grey brown silty clay
Inclusions			
occasional rounded pebbles			
occasional sub-rounded pebbles, iron staining			
occasional sub-rounded pebbles, iron staining			
occasional sub-rounded pebbles, iron staining			
occasional charcoal flecks, occasional rounded pebbles			
occasional sub-rounded stones			
Dating evidence			
2 sherds of prehistoric pottery			
1 sherd of Roman pottery (samian)			
4 sherds of prehistoric pottery			

Table 1. Ditch dimensions and fills (continued).

Ditch D				
Phase 3 cuts: F8/F14/F106				
Dimensions Sequence	1.12–1.8m wide	x 0.22–0.63m deep		
Basal Fill	Phase 3	Cut 8	Context 110	Description light grey brown sandy silt
	3	14	19	mid grey brown sand
	3	106	104	mid grey brown sandy silt
	3	106	111	mid grey brown sandy silt
Secondary Fills	4	8	101	hard packed mid grey brown silty clay
	4	8	100	hid grey brown sandy silt clay
	4	14	18	mid grey reddish brown stony sand
	4	14	149	grey brown sandy gravel
	4	106	103	mid grey brown sandy clay silt
	4	106	109	mid grey brown sandy clay silt
	4	8	99	mid grey brown sandy silt
	4	14	17	mid red grey brown silty sand
	4	14	148	brown silty clay
	4	106	108	mid grey brown silty clay
	4	14	16	mid grey brown sand
	4	106	107	mid grey brown sandy silt
	5	8	7	mid brown clay silt
	5	14	15	mid red brown silty sand
Final fills				
Ditch E				
Phase 4 cut: F4				
Dimensions Sequence	Phase 4	0.5m wide	x 0.12m deep	
Basal Fill	Phase 4	Cut 4	Context 3	Description orange brown clay silt
Ditch F				
Phase 4 cuts: F29/F35				
Dimensions Sequence	Phase 4	0.55–0.6m wide	x 0.2–0.29m deep	
Basal Fills	Phase 4	Cut 29	Context 34	Description firm brown clay
		29	28	compact mid reddish grey brown sandy silt
		39	10010	mid red brown silty clay
		39	40	mid red brown silty clay
Ditch G				
Phase 4 cut: F61				
Dimensions Sequence	Phase 4	0.85m wide	x 0.25m deep	
Basal Fills	Phase 4	Cut 4	Context 61	Description brown grey silty clay
	5	61	62	brown grey silty clay
Ditch H				
Phase 4 cuts: F10001/F10003				
Dimensions Sequence	Phase 4	0.5m wide	x 0.2–0.3m deep	
Basal Fills	Phase 4	Cut 10001	Context 10002	Description dark brown sandy clay
		10003	10008	dark brown sandy silt
		10003	10009	dark brown sandy silt
Secondary Fill		10003	10004	sandy clay
Dating evidence				
occasional sub rounded stones, iron staining				
frequent sub rounded pebbles				
frequent closely packed sub rounded pebbles, occasional charcoal flecks				
frequent closely packed sub rounded pebbles, occasional charcoal flecks				
frequent pebbles, occasional cobbles				
occasional charcoal flecks				
frequent sub-rounded grit and pebbles				
very frequent sub-rounded pebbles				
occasional sub rounded pebbles and cobbles				
occasional sub rounded pebbles and cobbles				
frequent sub rounded stones, occasional burnt clay and charcoal				
occasional sub-rounded pebbles				
occasional sand and gravel				
frequent pebbles, occasional cobbles				
frequent sub-rounded pebbles				
occasional charcoal flakes				
occasional rounded pebbles, very occasional charcoal flakes				
rare charcoal flecks, occasional sub rounded pebbles				
Dating evidence				
67 sherds of Roman pottery (2nd–3rd century AD)				
Ditch F				
Phase 4 cuts: F29/F35				
Dimensions Sequence	Phase 4	0.55–0.6m wide	x 0.2–0.29m deep	
Basal Fills	Phase 4	Cut 29	Context 34	Description firm brown clay
		29	28	compact mid reddish grey brown sandy silt
		39	10010	mid red brown silty clay
		39	40	mid red brown silty clay
Dating evidence				
sub-rounded pebbles				
occasional sub-rounded stones, charcoal flecks				
occasional charcoal flecks, occasional sub-rounded pebbles				
occasional charcoal flecks, occasional sub-rounded pebbles				
Dating evidence				
83 sherds of Roman pottery (2nd century AD)				
Ditch G				
Phase 4 cut: F61				
Dimensions Sequence	Phase 4	0.85m wide	x 0.25m deep	
Basal Fills	Phase 4	Cut 4	Context 61	Description brown grey silty clay
	5	61	62	brown grey silty clay
Dating evidence				
occasional sub rounded pebbles and charcoal flecks				
Ditch H				
Phase 4 cuts: F10001/F10003				
Dimensions Sequence	Phase 4	0.5m wide	x 0.2–0.3m deep	
Basal Fills	Phase 4	Cut 10001	Context 10002	Description dark brown sandy clay
		10003	10008	dark brown sandy silt
		10003	10009	dark brown sandy silt
Secondary Fill		10003	10004	sandy clay
Dating evidence				
15 sherds of Roman pottery (1st–2nd century AD)				
1 sherd of Roman pottery				
5 sherds of Roman pottery (2nd–3rd century AD)				

The similarity in date range of the two samples increase the confidence that can be placed on the deposit being undisturbed and that the charcoal within it was contemporary with the backfilling event.

Structure 2 and compacted surfaces. The secondary deposit in pit F44 consisted of silty sand with charcoal flecks, burnt clay and small stones (42)/(46). A single sherd of Black-burnished ware was found in (46). A sample from the secondary fill was taken for OSL dating, and this gave a result of 6 BC –AD 474.

The gullies of the L-shaped structural feature, F10001 and F10003, were filled with a dark brown sandy clay, with occasional stones and charcoal. There was also a relatively large ceramic assemblage found in the infill, including an amphora sherd, Malvern ware, and Severn Valley ware, indicative of a second century AD date. These gullies enclosed a zone of compacted reddish brown silty clay (10005) measuring 7m² and 0.08m thick, which included five sherds of Severn Valley ware. To the south a similar compacted surface (115) was observed extending c.5m from the ditch.

Interpretation and Discussion of Phase 4

During Phase 4 the enclosure was partially redefined in at least one location in Area B, by a wide, relatively shallow cut, which became gradually infilled by a silty clay. The lack of artefactual material or charcoal within this fill suggests a decline in domestic activity in close proximity. The form of this ditch and the nature of the infill deposit appear significantly different from the preceding phases, arguing for a change in function for this long-lived element of the site, and the fact that a ditch terminus was found at its western end is attributable to the existence of Ditch D cutting through the corner of the enclosure.

This change is also evident in the formation of gullies to the north which ran parallel to the enclosure, and may define a new smaller enclosed area at the northern edge of the site in Area A. The nature of this enclosure would have been less substantial than the main one to the south, and perhaps Ditches E and F represent a gully foundation trench for a fence line. A gap between the gullies show that an entrance faced south.

Ditch G and Ditch 11002 provide incomplete evidence for additional division of the site, but little can be interpreted from what has survived and was visible within the excavation area. Part of the activity during Phase 4 probably included decommissioning Structures 1 and 2. The evidence for this is in their uppermost fills which include a stony layer, burnt clay, charcoal and a white deposit which may have been decayed plaster, as well as residual pottery.

A large amount of Severn Valley ware was recovered from Phase 4 contexts, with the largest concentration of pottery on the site being found in the small extent of Ditches E and F (fills 3 and 40). The implication is that the fenced area, perhaps enclosure, represented by Ditches E and F might have separated a domestic zone from other activities. The fill of Ditch D also contained a large assemblage of Severn Valley ware, which stands out in contrast to the lack of artefactual evidence from the near-by Ditch B.

Phase 5

Post-Roman: represented by a spread of material including small abraded Roman pottery sherds and charcoal, recorded

as contexts 41 over much of the eastern end of the site, and the final infill of Phase 4 features; probable demolition and ploughing in of the concentration of Phase 4 Roman activity; infill of top of Ditch D and Ditch G; limited construction of new features.

Episodic flooding recorded widely over the site (masking earlier features) recorded as deposit 13, 41, and 113.

Spread of demolition debris: 41

Ditch B: final fill 54, 80

Ditch D: final fill 7, 15

Ditch G: infill 62

Ditch: F85:

Features: F87, F116, infills 86, 88, 117

Oven 2: final fill 10007

Description

During Phase 5 the archaeological evidence included the final infill to Oven 2, a loosely compacted dark brown silt (10007) which sealed the clay lining. This deposit contained oak charcoal and 1st to 2nd century AD pottery – a sherd of Malvern ware and a sherd of Severn Valley ware. In the eastern part of the site in Area A deposits included a 0.2m thick spread of abraded pottery contained within a pale orange silty clay matrix (41), which extended over an area approximately 20m². This deposition event appears to have been related to the development of an orange-brown silty clay subsoil (13) elsewhere within Area A, and also large areas in Area B that suggest alluvial deposition (113). These deposits varied in thickness up to 0.35m.

The Phase 5 Ditch B final infill episode consisted of a silty clay deposit with small pebbles, fired clay fragments and charcoal, c.2m wide and 0.2m deep. An assemblage of second-century pottery was found in this fill. Ditch D had an uppermost fill that comprised a brown silty clay to a sandy silt deposit with small pebbles and charcoal flecks. Ditch G had a very similar fill, a brown silty clay with pebbles and charcoal.

Two other features have been included within this phase located within the south-eastern quarter of Area A. These are Ditch F85 and a larger feature F87 which were cut through the demolition deposit (41). Ditch 85 was 1.22m wide and 0.45m deep and at least 1.7m long oriented north-east/south-west, with a possible terminal at its eastern end – although a feature found by BUFAU in 1991 could have been a continuation of Ditch 85 further east. Feature 87 was 0.8m wide and 0.21m deep and extended for 4m northwards from the southern edge of excavation. In addition a pit F116 located south-west of Oven 1 has been assigned to this phase. It was an oval shape with a west–east axis, 1.55m long, 1m wide and 0.48m deep.

The fills of these features are also included within Phase 5 and consisted of a brown clay silt with some gravel inclusions (86), and a more sandy silt (88) within feature 87 that also contained some charcoal and burnt clay flecks, as well as two sherds of Severn Valley ware and single sherd of samian. The fill of the oval pit consisted of a silty clay (117) very similar to the natural accumulation (13) deposit that was recorded over parts of the site.

Interpretation and discussion of Phase 5

This phase represents the termination of Roman domestic activity on the site, a period of demolition and levelling which resulted in a spread of abraded pottery, associated with flooding within the lower parts of the site in Area B. The development

of layers masking earlier parts of the site can be attributed to natural agency, such as erosion and flooding. The duration of this phase could have been relatively rapid, but equally it might represent a long period with little human activity affecting the accumulation of a subsoil over much of the site.

Phase 6

Post-medieval: drainage ditches, plough activity, represented by east–west oriented gully/drain F48/93, and later pebble-filled drains aligned north–south, F118 and F119. Build-up of subsoil and topsoil, and conversion of the eastern part of the site into a compound prior to expansion of the depot.

Description

An east–west oriented gully ran across the northern part of Area B. Differential machine excavation had removed parts of this feature before it was recorded, but it had formed a continuous feature 0.42m wide and 0.18m deep at its western end, and 1.45m wide and 0.11m deep at its eastern end. It was not very regular as a cut feature, but the profile included a concave base. It was filled with a brown silty sand with infrequent pebbles.

Two pebble-filled gullies were recorded in Area B, oriented approximately north–south and traversing the full width of the excavation. They were 0.3–0.4m in width with a steep side, but were not excavated to full depth: the more eastern of these two gullies had been identified previously in BUFAU's Trench 4.

Interpretation and discussion of Phase 6

Post-medieval drainage features set on very different alignments from the earlier archaeological ditches. This provides evidence for on-going water management issues with the site, which was susceptible to flood risk from rising ground water. The depth and nature of these features are unlikely to have seriously damaged underlying archaeological remains.

DISCUSSION OF THE RESULTS FROM THE FIELD INVESTIGATION AND POST-EXCAVATION ANALYSIS

Nature and duration of activity at Craven Arms B

The site at Craven Arms B has produced evidence for pre-Roman and early Roman activity including the

construction of a double-ditched enclosure, ovens, stockades, fence lines, drainage ditches, pits and surfaces. The related artefactual assemblage consists almost entirely of ceramics which date the majority of the site to the first and second centuries AD, and ecofactual remains which consisted of charred cereal grains, weed and wood species.

Scientific dating from radiocarbon determination of charcoal and charred grain, and from Optically Stimulated Luminescence (OSL) dating of fired-clay oven walls and sediments, has corroborated the general date range attributable from the pottery (Table 2). The OSL samples also provided a date for the deposition of the natural gravels on site into which the archaeological features had been cut, between 5017–3275 BC. Bayesian modelling of the various scientific dates and stratigraphic sequence has suggested that activity started during the period cal AD 35–120 (68% probability) and ended during the period cal AD 90–165, and that the main duration of activity probably spanned up to 115 years. The range at 95% probability extends the possible start of activity into the first century BC and the possible end of activity is extended to the mid-third century AD.

Parallels for the evidence found at Craven Arms B can be drawn from a number of local, regional and national sites.

Enclosures

The small enclosures of the Welsh Marches have been the subject of several studies (e.g. Whimster 1989; Jones 1991; Wigley 2003), mostly from air photographic evidence and some field survey, but comparatively little excavated evidence. Whimster's analysis concluded that the vast majority of enclosures were single-ditched and rectilinear, and that half (43) of the bivallate enclosures were rectilinear in form (see the distribution of these enclosures mapped as Figure 29 on page 40 in Whimster 1989). Jones's analysis of the hinterland around Wroxeter suggested that bivallate enclosures were more common before the later Iron Age–Roman period, and that the enclosed areas were generally 0.2–0.4ha. Wigley

Table 2. Scientific dating concordance.

Sample No	Context No	Description	OSL	C14 (2σ)	Ceramics	Phase and Period
OSL 8	53	oven clay lining	206BC–154AD	-	-	3? RB 1st–2nd C
OSL 15	53	oven clay lining	56BC–224AD	-	-	3? RB 1st–2nd C
SUERC-53994	64	fill of oven 53	-	22–130 cal AD	-	3? RB 1st–2nd C
SUERC-53995	64	fill of oven 53	-	73–225 cal AD	-	3? RB 1st–2nd C
SUERC - 53998	74	fill of stoke-hole 77	-	56–215 cal AD	-	3? RB 1st–2nd C
OSL 1	43	pit 44 primary fill	306BC–134AD	-	RB 2nd C	-
OSL 2	43	pit 44 primary fill	326BC–54AD	-	RB 2nd C	-
OSL 3	42	pit 44 secondary fill	6BC–474AD	-	RB 2nd C	-
OSL 5	56	Ditch B recut phase 4	124–444AD	-	prehistoric	4 RB 2nd–3rd C
OSL 6	58	Ditch B primary fill	296BC–244AD	-	-	1 prehistoric
SUERC - 53996	70	primary fill structure 69	-	86–239 cal AD	RB 2nd C	-
SUERC - 53997	70	primary fill structure 69	-	75–225 cal AD	RB 2nd C	-

Table 3. Enclosures and camps - relative sizes. Areas and dimensions have been taken from original report descriptions and/or plans.

Name	HER no.	Area (ha) approximate	Dimensions (m) approximate	No of ditches	Period
Craven Arms A	02045	0.2	40 x 50	1	RB?
Craven Arms B outer	02046	0.72	80 x 90	2	IA-RB
Craven Arms B inner	02046	0.35	55 x 65	2	IA
Halford	02375	0.3	48 x 60	1	IA?
Halford	04895	0.9	90 x 100	1	IA?
Stretford Bridge fort	02043	1.5	97 x 157	2	Roman
Craven Arms marching camp B	00620	0.9	90 x 100	1	Roman
Craven Arms marching camp C	02041	21.5	430 x 500	1	Roman
Craven Arms temporary camp	02024	0.15	30 x 50	1	Roman
Craven Arms temporary camp	02042	0.32	40 x 80	1	Roman
Craven Arms temporary camp	04189	0.17	10 x 170	1	Roman
Wistanstow fort	28736	-	No record	2	Roman
Bromfield E2	00488	0.11	32 x 34	1	IA
Bromfield E1 marching camp	00192	8.3	260 x 320	1	Roman
Duncote Farm	00046	0.56	75 x 75	1	Roman
New House Farm, Newbold	00009	0.25	50 x 50	1	Roman?
Sharpstones Hill A	00085	0.14	35 x 40	1	IA
Sharpstones Hill E outer	00015	0.72	85 x 85	2	IA-RB
Sharpstones Hill E inner	00015	0.36	60 x 60	2	IA-RB

suggested that univallate rectilinear enclosures were frequently located in lowland next to rivers, whereas bivallate enclosures were more likely to be set away from rivers.

Craven Arms B is a bivallate rectilinear enclosure securely dated through the recent excavations to the later Iron Age to early Roman period, in a location set back from the River Onny and enclosing an area of 0.72ha. These elements do not conform to the norm as suggested in the analyses above. Jones also made the point that many single-ditched enclosures were found grouped along Watling Street and around Roman military sites, and again Craven Arms B is interesting in being unusual as a large bivallate, rather than univallate, enclosure which is in close proximity to several Roman military sites and Watling Street. The excavated evidence from Craven Arms B, however, helps in refining some of the general hypotheses that earlier studies of cropmark evidence have produced. For example, although the site started as a bivallate enclosure in the later Iron Age, by the early Roman period it was a univallate enclosure, which would perhaps create a better fit with the models that Jones and Wigley have suggested than if the site was seen purely as a double-ditched enclosure.

Comparative excavated evidence is available from a handful of sites (see Table 3), including the 1965–7 and 1968–9 investigations at Sharpstones Hill A and E respectively (Barker *et al.* 1991), the later excavations at Sharpstones Hill E in 2005 (Bain 2007), Duncote Farm 2.5km to the north-east of Wroxeter excavated in 1990 (Jones in Ellis *et al.* 1994), Day House Farm, Newbold excavated in 1995 (Gaffney *et al.* 2007), and Bromfield excavated from 1978–80 (Stanford 1995).

Sharpstones E is probably the closest in date range to activity at Craven Arms B, and also comprised a double-ditched enclosure of almost identical proportions. The interpretation given to the excavated evidence was that the inner ditch (flat-based, 6m wide by 2.6m deep) and its primary fill preceded the outer ditch, which was of broadly similar dimensions and shape. The initial phase was ascribed a late Iron Age to early Romano-British date, whereas the second phase was Romano-British. A roundhouse and a possible four-post structure were found on the interior, as well as a palisade trench that ran parallel to the inner ditch, but the investigations did not look for any external archaeological evidence. Further excavations were undertaken in 2005, however, which confirmed that a second century AD recut had occurred into both of the enclosure ditches, and that the earlier phase had been of first to second century AD. The eaves-drip gullies for two roundhouses (12m in diameter) which predated the enclosure ditch, were found within the interior of the area later enclosed. The inner enclosure was square, each side 60m in length with sharp corners, with a 5m wide ditch of varying depth from 1.1–2.6m deep, whereas the outer ditch was set 12m further out, with each side 85m in length and rounded corners, 5–6m in width and from 1.5–2.4m in depth. A small external area was stripped during this phase of investigation, but no features were recorded.

Sharpstones Hill enclosure A was a single-ditched enclosure located to respect and reuse a pre-existing field system ditch along its northern edge. The enclosure was irregular but measured approximately 35m at the narrowest, and 48m at its widest external dimensions. The ditch profile was V-shaped with a width that varied

from 2m–5m, and a depth from 0.5m–1.75m. The enclosure contained a roundhouse, and a timber entrance structure or possible four post structure, but only VCP sherds were recovered from the ditch fill. A recut into the top of the ditch fill, however, contained second-century Romano-British pottery. Apart from the entrance structure no external features contemporary with the enclosure were identified, although curiously an external bank was detected along the southern side.

Duncote Farm was a single-ditched enclosure approximately 75m square, with a V-shaped ditch c.2m in width and 0.5m–1.5m in depth. Internal and external hearths were found as well as stakeholes suggesting some form of occupation, and the possibility of pottery manufacture within the vicinity, although no kilns were found. The pottery contemporary with the enclosure was dated to the third–fourth centuries AD, but an earlier field system was also identified.

Day House Farm was a single-ditched enclosure c.50m square, with a V-shaped ditch 3m wide and 1.3m deep. Evidence for an internal bank was obtained, and some internal structural features, consisting of postholes and a line of stones. There was no dating evidence, but two enclosures further east together with Day House Farm, appear to form a row set back 600m to the north of the road from Wroxeter westwards to Forden Gaer and Caersws, whilst proximity to the settlement at Meole Brace, as well as Roman villas at Whitley Grange and Cruckton, have led to a suggestion of these enclosures forming an integral part of a Romanized landscape (Gaffney *et al.* 2007). More recent excavation of the road from Wroxeter, however, has proved that it was engineered during the late Iron Age (Malim and Hayes 2012) and so these enclosures could, by analogy, also be of late Iron Age origin, located parallel to the road.

The Bromfield enclosure consisted of a single V-shaped ditch, c.2.5m wide by 1.3m deep, with a conjectured internal bank 3.5m wide and 1.2m high. The enclosure contained two four-post structures and a large number of post-pits and larger pits (many of which were clay-lined) and described as boiling pits. Large quantities of heat-fractured stones had been deposited in the upper-fills of the enclosure ditch, and radiocarbon dating suggests that activity occurred during the later Iron Age and Romano-British period. Some iron-working was identified external to the enclosure, and carbonized seeds of emmer and spelt together with a quern, suggested the processing of cereals on site (Stanford 1995, 114).

In contrast to Craven Arms B the ditches at Sharpstones Hill E were considerably more substantial, although both sites contained evidence that have been interpreted as palisade trenches. Beyond these morphological similarities and the occurrence of fairly standard ceramic assemblages for the region, there is little that can be gained from further comparison as

the evidence from Craven Arms B is all external, and sheds little light on what lies within the interior of the enclosure. Duncote Farm is of too late a date to act as a useful comparison, but there is some similarity with this and Sharpstone Hill A in that field systems pre-existed, and at Craven Arms B some external features suggest that the enclosure was also fitted within a field system (e.g. Ditch C, which can be seen as a cropmark beyond the limits of excavation, ran parallel to the western side of the enclosure). The evidence from Bromfield provides comparison, with a similar sized enclosure ditch, carbonized cereals found on site, and evidence for pyrotechnic activities, whilst the enclosure ditch at Day House Farm could also be argued as of a type and dimensions perhaps similar to the inner enclosure of Craven Arms B.

Ovens

The closest excavated site with evidence for ovens is from Bromfield 1981–91 (Hughes *et al.* 1995) c.7.5km to the south. This investigation was of a Roman marching camp located on a terrace of the River Onny, between Craven Arms and Ludlow. Four ovens were found, three of which were located within the camp enclosure and formed figure-of-eight features, over 3m in length and each lobe c.1.8m wide, interpreted as dug into the rampart bank (which did not survive). They did not have burnt clay linings, and the depth of the features varied from 0.55–0.75m. Charcoal lenses were detected during excavation. Plant material was poorly preserved but charred remains of bread were found, and the interpretation given to the ovens was that their function was not that of corn-dryers, but were more likely used as bread-ovens. The date for the marching camp is c.50 AD.

At Rhyn Park north of Oswestry, c.60km from Craven Arms, ovens were found set into the rear of the fortress rampart during excavations in 1977 (Jones, 1978; Jones 1982). These were circular structures c.1.3m in diameter, 0.2m in depth, and lined by one or two layers of burnt clay. They were interpreted as short-lived due to the charcoal rakings found in them which ran down into the partially silted infill of the previous marching camp ditch, and the subsequent construction of a timber building on top of them. The date of these ovens, phased as intermediary between the marching camp and the more permanent fortress, would attribute the ovens to the early part of the second half of the first century AD. No specific function was attributed to them by the excavators, but a parallel with similar features found at the vexillation fortress at Longthorpe Farm, Peterborough noted that these features had been interpreted as field kilns for the production of pottery.

At Metchley Roman Fort in Birmingham, c.65km east of Craven Arms along the ancient route through Quatford and Greenforge, oven-like features were found during excavations in 2004–5 (Jones 2012, 27–31). One was described as ‘boat-shaped’ and the others as

oval pits which may have had industrial uses, within Phase 1D/1E (intervallum). The definite oven was 2.4m long north–south by 1m wide, 0.4m in depth, and with a burnt clay lining. Successive episodes of collapsed clay superstructure were interspersed with charcoal-rich layers and silts, showing repeated use of the oven. To the west of this feature a second oven was partially preserved. Three oval pits lined with cobblestones and filled with charcoal-rich silts were also found, at least one of which had been cut into the rampart. Their dimensions were 2.16–3m in length by 1.5m wide, and up to 1.6m in depth. All of these features were interpreted as ovens ‘probably for breadmaking’, although at one point in the text the oval pits are described as probably for industrial purposes such as quenching tanks. They are clearly very different in nature from the clay-lined ovens, which may well have been for baking bread. The date for this phase of activity is attributed to before AD 85.

Examples from sites further away include a similar oven to Craven Arms that was excavated at Showell Farm, Chippenham in 1999 (Young and Hancocks 2006). This was a T-shaped oven with the long axis c.4.5m long by 1.2m wide, with the T-bar c.2.75m by 1m, and lined along the base by limestone which was described as scorched. The depth of the oven is not given in the report but 0.14m of fired clay sealed it, presumed to be from the superstructure. There was a stoking area at the south-eastern end, and almost the entire assemblage of charred plant remains from within the T-bar consisted of cereal grain (emmer/spelt and barley). The site phasing attributed the oven to Phase 2d, dating to the period c.AD 150–200.

The small Roman town of Stonea in the Fens was excavated by the British Museum during the 1980s, and their excavations produced good evidence for ten ovens or kilns (Jackson and Potter 1996, 103–106). These were described as ‘recessed only slightly into the ground’ and were divided into two types, boat- or bottle-shaped, and figure-of-eight or dumbbell-shaped. Both types had external measurements within 1.8–2.05m long, by 0.55–0.7m wide. Most of the ovens were oriented north–south with flues at their southern ends, and an arrangement that consisted of oven chamber, flue, with stoke-hole and rake-out material surviving to a shallow depth. Well-preserved examples of the flues consisted of ‘a small rectangular clay-walled adjunct to the oven chamber’ with a plinth of fired clay situated between the flue and oven chamber. Evidence for superstructure suggested a hull-shaped or domed shape made of fired clay 0.05–0.12m thick, and height from base of flue to springing for the roof was 0.32m. The colouring of the fired clay, yellow and red rather than purple, suggested a relatively low temperature, and there was no evidence for them having been used as pottery kilns.

In comparison the ovens at Craven Arms do not appear to closely resemble the evidence from these other

sites, most of which have a bulbous, or cross passage, at the end of the flue. The dimensions of the ovens at Stonea, however, are broadly similar to Oven 1 at Craven Arms, which was 1.8 by 0.6 by 0.4m deep. It is possible that shallower parts of the ovens at Craven Arms may have been destroyed by later ploughing, but Oven 1 appears well preserved, revealing a feature with a narrow chamber. The clay lining of the oven reveals a pattern of differential heating through the changeable colouration of the fired clay and pockets where it has not survived, presumably because the clay in this area never quite reached the temperatures for irreversible change, above c.500°C. As there is no indication of vitrification the temperature would not have exceeded 1000°C, and so the function of the oven is unlikely to have been for pottery-making or smelting activities. The interpretation of this feature as having a corn-drying function is more likely than that of bread-making, when the surviving evidence is compared to the form of ovens excavated from the comparative sites.

Structural features

Metchley Roman Fort during the first century AD pre-Flavian period, included large pits which were interpreted as foundation trenches for a 5m² timber-post building – Structure 18.6 in Phase 3B–4B (Jones 2012, 55–57). These included four post-pits that were sub-rectangular or oval in form, vertical-sided and flat-based, ranging from 0.6–0.8m in width, with depths of 0.32m–0.85m, and 1.4m in length. These features appear similar to some of those from Structures 1 and 2 from Phase 3 as excavated at Craven Arms.

Following disuse of Structure 18.6 a later structure at Metchley consisted of an L-shaped arrangement, 9.7 by 6m in length, evidenced by shallow palisade trenches 0.45m wide and 0.1–0.2m deep – Structure 18.5 (*ibid.* 55–57). This feature appears very similar to Structure 2 from Phase 3 excavated at Craven Arms, and was also located across an entranceway, as was the case at Craven Arms.

Beam-slot foundations for timber buildings were also identified, defined as a series of parallel and perpendicular gullies 0.4m wide and 0.12–0.3m in depth – e.g. Structure 18.3, (*ibid.* 61–2), and structures 9.4, 9.5 and 9.6 (Jones 2011, 47–9). Structure 18.3 was defined as a long building with rooms located off a corridor, and the more incomplete plans for the other structures suggested rectilinear arrangements with a series of rooms. The evidence for timber buildings at Craven Arms is more fragmentary but some of the features would appear similar to those identified at Metchley.

Closer to Craven Arms, excavations at Pentrehyling Fort (Brompton), 2km south-west of Church Stoke, also had evidence for timber buildings (Allen *et al.* 2015, 26–34). Steep-sided, flat-based construction trenches for rectilinear structures ranged in dimension from 0.3–0.65m in width, and 0.03–0.38m in depth.

Postholes were identified set into these trenches, and pits were also described in and around the foundation trenches. The majority of structures were interpreted as barrack blocks, but Building 5 was interpreted as a store with a partially raised floor, with large postholes along the eastern wall required for supporting the structure. Unfortunately the report does not include sufficient detail to establish a definitive comparison with the features excavated at Craven Arms, but Structures 1 and 2 could have formed similar deeper post settings for supporting a raised building, the shallower elements of which might have been ploughed away.

INTEGRATION OF CROPMARK AND PREVIOUS ARCHAEOLOGICAL EVIDENCE AT CRAVEN ARMS

Correlation of Craven Arms B enclosure cropmark plot and ground evidence

The oblique air photograph taken in 1976 has been plotted against an OS base map by use of computer analysis in Adobe Illustrator using 1970s historic mapping (to correlate features visible on the air photograph with features surveyed on the map such as the corner of the Railway sheds, since demolished). This has allowed a reasonably accurate location against the modern map, and thus has allowed valid comparison of modern and historical mapping with the archaeological features revealed in 2013, and because two of BUFAU's 1991 trenches were found, it has been possible to plot these more accurately as well.

Excavation has shown the calculation of 8m between enclosure ditches from the aerial photograph cropmark evidence was incorrect, and that the actual distance was 3m. In addition to the main enclosure, part of a second double-ditched enclosure was plotted to the west, and an oblique ditch between the enclosures. This latter feature was recorded as Ditch C in the excavation, assigned to the prehistoric Phase 1, and interpreted as a palisade trench which ran approximately parallel to the western side of the enclosure.

Correlation of BUFAU investigations

Due to the problems with survey and vandalism in 1991 the excavation trenches and geophysical plot from BUFAU's investigations of Craven Arms B were inadequately and inaccurately mapped in their 1991 report (Ferris 1991). During excavation in 2013 two of BUFAU's trenches were located (Trenches 1 and 4) but there was little that could be correlated as evidence for the features that they had interpreted from the field investigations. Ditch D and the post-medieval drain F118 can be seen in BUFAU's Trench 4 trench plan (F9 and F11 respectively), and there is a ditch, F1, which matches with the projected alignment of the enclosure ditch at the southern end of BUFAU's Trench 1. Other

features recorded in 1991 as of archaeological origin, such as a second ditch, two postholes and two 'irregular disturbances' further north in Trench 1, were shown to have been incorrectly interpreted by the results of area excavation in 2013. This comparison demonstrates the difficulty that small-scale trial trenching can have in providing robust archaeological evidence.

Of those features that appear to correlate with results in 2013, the double ditch F1 at the southern end of Trench 1 is on the projected alignment of the outer enclosure ditch, Ditch B. BUFAU recorded this as 3.5m wide and 0.85m deep, with four infill episodes and a small collection of Romano-British pottery. This compares well with Ditch B, Phases 4 and 5 from 2013, which measured 3.2m wide by 0.6m deep (see Colour Plates 4 and 5). In addition two small backfilled discrete features just north of F1 were also spotted during the 2014 watching brief along the southern edge of the site. A ditch within BUFAU's Trench 4, F9, was recorded as a 'weathered' V-shape, erroneously recorded as 2m wide by 0.8m deep, but BUFAU appear to have used an incorrect scale on their drawing, and the measurements were actually 1m wide by 0.4m deep, filled with clay-silt and pebbles. This compares to Ditch D from the 2013 investigations which was U-shaped, 1.2m wide and up to 0.5m deep, and with similar fill material (Colour Plate 10).

The distribution of camps and enclosures within the Craven Arms landscape

Analysis of cropmark enclosures in the Welsh Marches was undertaken in the 1980s (Whimster 1989), and double ditched rectilinear enclosures are examined on his page 45. This notes that the group comprises largely square enclosures with closely set ditches, and it specifically refers to Craven Arms B (PRN 02046) as being large, and resembling 'the formal precinct of a Roman villa', although the evidence for this interpretation is not referenced. The plot shows an entrance in the south eastern side of the enclosure, and therefore on the opposite side to the activity excavated and recorded during the investigations reported upon in this article. As shown on Colour Plate 1 Craven Arms B is located adjacent to the road from *Ariconium* (Weston-Under-Penyard), and cropmarks on the western side suggest that a second enclosure might have extended the enclosure complex as far as the road, divided from the main enclosure by a field ditch (or palisade). What significance this positioning between the enclosure and the road might imply is open to debate, but it would appear to have been of greater importance for Craven Arms B than Watling Street, which lies 0.4km to the west. Comparative data for selected other enclosures and camps is presented in Table 3.

A second square enclosure, Craven Arms A (PRN 02045), is located 0.6km to the south-west and close to Watling Street (Colour Plate 1). This has a single

complete ditch circuit but cropmarks suggested that three sides of a smaller enclosure also existed, and so this enclosure has been referred to as a possible temple. It was investigated by BUFAU in 1991 as Area A in their report, which could not locate the hypothetical interior ditches of the smaller enclosure. A single pit in the centre of the enclosure was discovered, containing slag and a few sherds of Romano-British pottery.

Two small enclosures have been plotted as cropmarks near Halford, c.500m (PRN 02375) and 750m (PRN 04895) to the east of Craven Arms B, on the far side of the River Onny. These were set back from the crossing point for the ancient routeway (the Hen Ffordd (see below)) which ran from Greenforge to Church Stoke and beyond (Colour Plates 1 and 10), and these formed a west-east linear pattern with Craven Arms B. The first was identified by Whimster in 1982 as a single ditched feature with four equal sides and attributed a prehistoric date, and the second was identified by Chris Musson in 1994, described simply as a 'rectilinear enclosure of prehistoric date'. On the top of the hill to the east of the Onny lies Norton Camp (PRN 00158), a D-shaped, double-ramparted, prehistoric hill fort. The fact that a site such as this lies within the area, demonstrates the strategic importance of controlling the route and the crossing point of the River Onny.

Military enclosures at Craven Arms include the fort at Stretford Bridge, Cheney Longville (PRN 02043), two 'marching camps' B and C (PRNs 00620, 04021) a 'temporary marching camp' (PRN 02024), and two 'temporary camps' (PRNs 02042, 04189). All of these (apart from Marching Camp B), together with Craven Arms A and the enclosures on the east side of the river, have been located on higher land surrounding the river valley (as can be seen on Colour Plate 1). The fort lies c.1.5km north of Craven Arms B located on the high ground overlooking the confluence of the Quinny Brook with the River Onny, and controlling the crossing of Watling Street across the latter. Between the fort and Craven Arms B lie both marching camps and also one of the temporary camps, at c.1km and 0.4km distance. Marching Camp C has clearly been built on a much larger scale than the other military enclosures and presumably reflects a specific campaign during the early years of the conquest. Marching Camp B is located on lower ground similar to Craven Arms B and is situated at the junction of Watling Street and the Hen Ffordd. The evidence for the other two marching camps is slim, based on incomplete cropmarks, and these lie c.0.7km to the west and c.1.6km to the north-east of Craven Arms B. All these camps can be seen to have been located with easy access to water sources, small streams or the River Onny.

Three major types of military installation have been identified in connection with the campaign to conquer Wales: marching camps, short-lived (temporary) camps, and forts or fortresses, often associated with campaign

routes along river valley (Burnham and Davies 2010, 38). All of these categories are apparent at Craven Arms, and the assumption is that the camps were probably pre-Flavian constructed in the period 48–61 AD (*ibid.*, 40; and see also 282 catalogue no. 52 for description of the fort). Marching Camp C could represent a campaign base and/or over-wintering, and could have been built at much the same time as Marching Camp B. The roads were probably also initially surveyed and constructed during this period of intense military activity and occupation of the frontier zone (*ibid.*, 43), with a linear arrangement of military bases facing west into Wales being formed, to provide effective control of access into, and out of, Wales (*ibid.* 41).

Analysis of the wider landscape setting for Craven Arms B and its relationship to ancient routes and Roman roads

Various studies have included analysis of the communications network during the Roman period within Shropshire, the Marches and the West Midlands (e.g. Margary 1973, Webster 1991, Laffin 2001, Burnham and Davies 2010). Webster identifies Craven Arms as a nodal point in the roads network (Webster, 65 and Figures 13 and 25) and explains the reasoning for the east-west route from Greenforge to Forden Gaer (the Hen Ffordd) as being of prehistoric origin (63–4), continuing west as the Kerry Ridgeway.

Ivan Margary's studies of the Roman road system in Britain has formed the basis for an incomplete, but workable hypothesis of the main routes used during Roman times. A representation of the Shropshire system of Roman roads and Romanized prehistoric routeways is shown in Colour Plate 11, and this demonstrates the importance of Craven Arms as a crossroads as well as major river crossing. Apart from the prehistoric east-west route which forks to form two westerly routes, it is extremely likely that north-south routes following the river valleys ran through Craven Arms, which were formalized in Roman times by construction of Watling Street and the road to *Ariconium* (Weston under Penyard). Watling Street West has been given the label route 6b by Margary, to differentiate it from 6a which ran north from Wroxeter to Chester. The southern route 6b connected Wroxeter to *Bravonium* (Leintwardine) and on to *Isca* (Caerleon) (Margary 1973, 317, 320). As Colour Plate 1 shows this entered Craven Arms crossing the river from Wistanstow near the fort at Stretford Bridge, and then makes an abrupt turn south-westwards at the north-eastern corner of Marching Camp C. The line of the road survives as a green lane which passes the western side of Marching Camp B, before becoming a small road called Watling Street or Park Lane (Figure 25). The road to *Ariconium* (Margary route 613 (1973, 331)) is projected as heading for Craven Arms, although physical evidence is only traced by Margary as far as Ashton, Herefordshire. Various people have suggested



Figure 25. Watling Street at Craven Arms looking south.

its continuation through Woofferton and Ashford Carbonel towards the crossing of the River Ludd at Ludlow, and investigations in 2011 found a road foundation 5.8m wide by 0.1m thick comprising loosely compacted stones bedded on a c.0.2m thick foundation of sandy-clay (with possible mudstone paving slabs), typical of Roman methods (Colour Plate 12), but no definitive dating evidence was recovered (Malim 2012). At Craven Arms hedge boundaries and historical map evidence suggests the line of a road might have run close to the south-western corner of the enclosure. This has been interpreted here as the postulated route Margary 613 from *Ariconium*.

The east-west route that Webster called Hen Ffordd was labelled route 193 by Margary who described its origin as Greensforge near Stourbridge, via Quatt Bridge near Bridgnorth, and south-westwards along Corve Dale to Craven Arms (Margary 1973, 296). He then describes its route westwards 'as direct as the difficult country allows' towards Newtown and Caersws in Powys. This road (starting as Long Lane in Newington) would also have connected Craven Arms to the marching camps at Brompton and the forts at Pentrehyling (near Church Stoke) and Forden Gaer (near Montgomery), and prehistoric enclosures such as Wart Hill (Carwood) were located along its route. Its continuation west and south-westwards from Pentrehyling included the prehistoric Kerry ridgeway (Laflin 2001, 7). Military use of existing prehistoric roads is attested by classical sources as for example, quoted in Burnham and Davies (2010, 43).

CONCLUSIONS

The investigations at Craven Arms B have accurately located the 1970s cropmark evidence and BUFAU's 1991 trial trenches as well as recovering important information as to the date and character of the enclosure, its possible duration of occupation and related external activity. The enclosure was first laid out during the

late Iron Age as a double ditch on a square plan approximately 80 × 90m for the outer ditch, and 55 × 65m for the inner ditch. The sides were orientated approximately along cardinal lines, east-west and north-south. The inner ditch was V-shaped 1.2m wide and 0.52m deep, whilst the outer ditch was 1.4 × 1.2m for Phase 1 (Iron Age), but infilled and recut on at least two occasions during the first to second centuries AD, which also led to variations in dimensions and alignment. The enclosure had been located with respect to an Iron Age field division, interpreted as a palisade c.2.4m high. An oven was also identified for this pre-Roman phase. A relatively long period of infill occurred after the cutting of the Phase 1 ditches, and it is tempting to suggest that the military presence evident from the various camps at Craven Arms, could have caused a hiatus during the conquest period, before the second phase ditch cutting re-established settlement during the early Roman period in the second half of the first century AD.

During the first to second centuries AD physical evidence for activity external to the enclosure's northern side was discovered. This consisted of structural features such as ovens, timber-frame buildings, including some substantial post-settings perhaps suggesting raised structures (interpreted as possible granaries), and spreads of occupation debris, as well as fence-lines and ditches. The linearity of these features suggests a definite planned element to the activity north of the main enclosure. Demolition and abandonment of the site appears to have occurred during the second to third centuries AD, most probably during the later second century according to Bayesian modelling of the scientific dating and stratigraphic data.

During the Phase 1 Iron Age period Craven Arms B was not the only enclosure within the Craven Arms landscape, but was part of a known contemporary environment which included an east-west routeway, the Hen Ffordd connecting mid Wales with the Midlands, and with two other enclosures on the east side of the River Onny, as well as the hillfort to the south-east known as Norton Camp. It is probable that north-south routes also existed during this period following the river valleys through the hill country.

Craven Arms B was located on low-lying land about 0.5km west of the River Onny, but within poor quality land prone to flooding. Any settlement in this location would have necessitated the large enclosure ditches to help keep the central area dry (similar to medieval moated sites). The investment of effort in constructing this enclosure implies a wealthy patron, and an assumption that Craven Arms B might have been an elite residence.

The concentration of Roman military enclosures in the surrounding landscape reflects the strategic importance of Craven Arms during the first century AD as a nodal point in the road system, and base from which to launch attacks into Wales. The Romanisation

of prehistoric routeways probably occurred during the period 49–61 AD, and it is notable that Watling Street was constructed without apparent reference to Craven Arms B in terms of alignment or proximity, whilst the road from *Ariconium* does appear to respect the enclosure by passing just to the south-west of it. Cropmarks for a western extension to the enclosure about the road, perhaps implying its existence before the extension was constructed. The planned nature indicated by the linearity of the features north of the enclosure reflects the axes of the enclosure rather than the road network.

The flourishing of activity in the late first and second centuries AD could well have been influenced initially by the presence of the Roman military and their needs, and later by proximity to a well-used road network. Craven Arms A enclosure could have been constructed during this period adjacent to Watling Street to benefit from the traffic along this arterial way, and further investigations within Craven Arms could well discover more extensive evidence for both the Iron Age and Roman periods. Industrial residues at Craven Arms A found in 1991 would perhaps support such a hypothesis, with ironworking activities to supply military patrons

or travellers, but at Craven Arms B the excavated evidence would suggest a more agricultural function. Although local Severn Valley wares and Malvern wares predominate, the types of pottery found on site show wider connections within Britain and with continental Europe. Central Gaulish samian and Spanish amphorae are present in the assemblage, as well as Blackburnish ware from Dorset. The diverse origin of the ceramic evidence must owe much to the location of the enclosure in proximity to several roads. It also implies a relatively high status community.

The abandonment of Craven Arms B cannot be assigned to any specific or cataclysmic cause, such as a fire, and in general the Romano-British period during the second to third centuries AD was relatively peaceful. There could be a link between demise of early settlements, however, with the decline of a military presence within the area following pacification of the local population and when troops were sent to the north of the province. This would have affected the economic basis of some communities, especially those besides roads and who supplied services or products for the army. It might have been this factor that led to the eventual abandonment of the settlement.

SPECIALIST ANALYSES AND DATING

POTTERY ASSESSMENT

By Jane Timby 2013

Introduction

The archaeological work resulted in the recovery of 401 sherds of pottery weighing just under 3kg accompanied by three fragments of ceramic building material (CBM) and sixteen small pieces of fired clay. Most of the pottery dates to the Roman period but there are also eleven sherds potentially of later prehistoric date and a single post-medieval piece.

Pottery was recovered from 31 defined contexts with eight unstratified finds. The assemblage was in fairly poor condition with slightly abraded, fragmented pieces reflected in a low overall average sherd weight of 7.4g. Surface preservation was poor. There were a few instances of multiple sherds from single vessels. Chronologically diagnostic sherds are rare.

Methodology

For the purposes of the assessment the assemblage was scanned to determine the form and fabrics and the likely date of the pieces. These were quantified by sherd count and weight for each context. The fabric codes (in brackets) used for known named or traded wares reflect those found in the National Roman fabric reference collection (Tomber and Dore 1998). Other fabrics are coded generically reflecting the firing colour and nature

of the inclusions in the fabric. The resulting data is summarised in Table 4.

Results

Prehistoric

Eleven sherds of a thick-walled handmade ware were recorded from four contexts – (5), (27), (82) and (102). In three cases the sherds were unaccompanied by other sherds; in context (27) the sherd appears to be redeposited in a Roman layer.

With the exception of a base sherd from (27), the pieces are all unfeatured body sherds. The fabric contains very coarse sub-angular inclusions of quartzite.

The technology and the nature of the fabric might suggest this dates to the later prehistoric period. Very coarse rock tempered pottery, including one with a coarse quartz-temper, was recorded from The Wrekin hillfort (Morris 1984, 76) which might be analogous. These latter wares are dated to the later Bronze Age or early Iron Age.

Roman

The bulk of the assemblage dates to the early-mid Roman period and comprises a mixture of imported continental and regional imports, local native handmade wares, Severn Valley wares and Roman wares of unknown provenance.

The imports are restricted to six sherds of samian and twelve sherds of amphorae. The samian is poorly

preserved but comprises one South Gaulish sherd (La Graufesenque) (LGF SA) from a decorated bowl and five Central Gaulish sherds (Lezoux) (LEZ SA) which include a cup (Dragendorff type 27) and a decorated bowl (Dragendorff 37). Provisionally these would suggest a date span from the later first century AD into the second century AD.

The amphora include ten sherds from Baetican wares (BAT AM) imported from Southern Spain and used to transport olive oil; one sherd probably from a Gallic wine amphora (GAL AM) (Figure 26:5) and one unidentified sherd. The Baetican and Gallic vessels are the two commonest types to be imported into Britain from the first–third centuries AD. One of the Baetican sherds (73, SF1), probably from the globular Dressel 20 form, has a lead rivet repair with part of the rivet still *in-situ* suggesting re-use of the vessel.

Recognisable regional imports are limited to eight sherds of Dorset Black-burnished ware (DOR BB1) made in the Poole Harbour area. The sherds are largely from jars and of second century date.

Native wares account for 7% of the assemblage by count and are all handmade wares in fabrics typical of the Malvern area (MAL RE A) (e.g. Figure 26:4). This is a pre-Roman Iron Age production which continued to be used well into the Roman period. Vessels include a straight-sided dish with a burnished interior (Figure 26:10).

The main components of the assemblage are oxidised and reduced Severn Valley wares which collectively

account for 69% by count. These wares can be divided into early variants distinguished by the presence of grog and or organic inclusions (here referred to as SVW EA); the more standard oxidised type (SVW OX) and a reduced (grey) variant (SVW RE). This ware is another long-lived one with probable pre-Roman antecedents (Timby 1990), which continued into the Roman period in increasingly standardised fabrics.

Forms present at Craven Arms included carinated cups which generally date to the first to early second century; tankards (Figure 26:7) wide-mouthed jars (Figures 26:3, 26:6, and 26:8); storage jars; bowls with horizontal handles (Figure 26:9); dishes and in a grey variant, a ring-necked flagon (Figure 26:1). In terms of date the vessels are predominantly first or second century although at least one, a pendant-rimmed jar from (18), is more likely to date to the mid-second to third centuries.

The remaining Roman wares largely comprise oxidised sandy wares which include a cornice-rim beaker (68) (Figure 26:2) of early second-century date. In addition there are isolated sherds of a fine micaceous grey ware, and single sherds of a white-slipped oxidised ware and a white ware which could be a Mancetter-Hartshill product.

Post-medieval

A single sherd from a post-medieval/modern unglazed red earthenware (flower-pot) came from the unstratified finds.

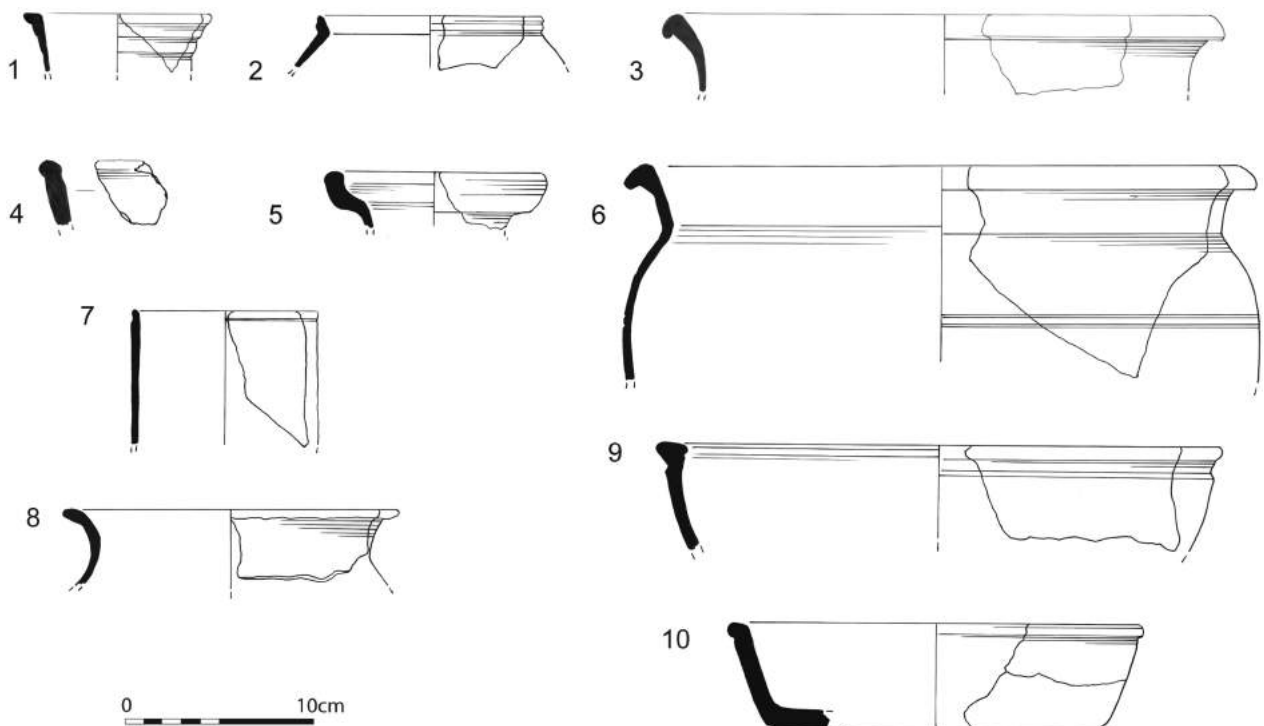


Figure 26. Roman pottery drawings.

Table 4. Craven Arms Enclave B: pottery spot dates with phases.

Context	prehistoric	Samian	amphora	Malvernian	SVW	BB1	other	post med.	Total No	Total Wt gms	Date	CBM (No)	FC (No)	Phase	Feature
3	-	-	-	-	67	-	-	-	67	195	C2-C3	-	-	4	Ditch E
5	2	-	-	-	-	-	-	-	2	5	prehistoric	-	-	1	Ditch C
16	-	-	-	-	3	-	1	-	4	10	Roman	-	-	4	Ditch D
18	-	-	-	-	5	-	-	-	5	74	mid C2-C3	-	-	4	Ditch D
20	-	1	-	-	-	-	-	-	1	3	Roman	-	-	1	Ditch C
27	1	-	1	-	2	-	-	-	4	50	Roman	-	-	3	Ditch B
30	-	-	-	-	1	-	-	-	1	0.5	Roman	-	-	3	Structure 1
33	-	-	-	-	2	-	-	-	2	8	late C1-C2	-	1	3	Structure 1
40	-	-	1	-	81	-	-	-	82	475	C2	-	-	4	Structure 2
42	-	-	-	-	8	4	1	-	13	79	C2	-	-	4	Structure 2
43	-	-	-	-	4	-	-	-	4	67	C2+	-	-	3	Structure 2
46	-	-	-	1	-	1	-	-	2	24	C2	-	-	4	Structure 2
66	-	2	1	11	6	1	11	-	32	260	C2	-	1	4	Structure 1
68	-	-	-	-	-	1	1	-	1	12	C2	-	7	3	Structure 1
70	-	-	-	3	25	1	-	-	29	86	C2	-	-	4	Structure 1
71	-	1	-	-	3	1	3	-	8	246	C2	-	2	4	Structure 1
73	-	1	8	-	-	-	-	-	9	246	C2	-	-	3	Structure 1
80	-	-	-	-	-	-	36	-	36	106	C2+	-	-	5	Ditch B
82	4	-	-	-	-	-	-	-	4	4	prehistoric	-	-	1	Ditch A
88	-	1	-	-	2	-	-	-	3	11	C2	-	-	5	Feature 87
102	4	-	-	-	-	-	-	-	4	15	prehistoric	-	1	1	Ditch C
103	-	-	-	-	45	-	-	-	45	252	C1-C2	-	-	4	Ditch D
129	-	-	-	-	1	-	-	-	1	7	Roman	-	-	4	Ditch D
131	-	-	-	-	-	-	1	-	1	3	Roman	-	-	1	Ditch A
170	-	-	-	-	-	-	2	-	2	43	Roman	-	-	2	layer
603	-	-	-	-	2	-	1	-	3	57.25	C1-C2	-	1	4	Ditch D
10002	-	-	1	13	1	-	-	-	15	370	C1-C2	-	-	4	Ditch H
10004	-	-	-	-	5	-	-	-	5	121	C2-C3	-	-	4	Ditch H
10005	-	-	-	-	5	-	-	-	5	51	Roman	-	-	4	layer
10007	-	-	-	1	1	-	-	-	2	67	C1-C2	-	1	5	Oven 2
10008	-	-	-	-	1	-	-	-	1	6	Roman	-	2	4	Ditch H
c.0.	-	-	-	-	4	-	-	-	4	11	C1-C2	-	-	-	-
us	-	-	-	-	3	-	-	1	4	22	C2-C3/pm	3	-	-	-
TOTAL	11	6	12	29	277	8	57	1	401	2986.75	-	3	16	-	-

Pottery-type key: SVW = Severn Valley ware, BB1 = Black-burnished ware, CBM = ceramic building material, FC = fired clay

Ceramic building material (CBM) and fired clay

Accompanying the pottery were sixteen fragments of fired clay weighing just 47g. The pieces were small and distributed across eight contexts. None appear to be featured or heavily burnt to indicate their original use.

Three small undated fragments of CBM featured in the unstratified material. Other material designated as possible CBM is probably sandstone.

Chronology

The earliest pottery appears to be of later prehistoric date. Three contexts (5), (82) and (104) produced this ware and are thus potentially of later Bronze Age–Iron Age date.

The bulk of the assemblage dates to the early Roman period suggesting a main phase of occupation spanning the second part of the first century AD into the second century. Occupation could have continued into the later second or early third century but evidence for this is slight and there is no later Roman pottery present.

As might be expected the assemblage is dominated by Severn Valley wares, a particularly long-lived industry spanning the first to fourth centuries and the main pottery supplier in the area. Previous work at Craven Arms (Ferris 1991) produced a particularly small assemblage of just thirteen sherds again dominated by Severn Valley wares. The only featured sherd, a local mortarium, indicated a second-century date which would be compatible with this recent assemblage. The generally low incidence of Black-burnished ware, which became much more widespread in the later Roman period in this area, also emphasises the focus of activity in the earlier to mid second century.

The site did have access to imported wares but the samian only accounts for 1.5% of the Roman assemblage, a percentage that would be regarded as very typical of a rural settlement of some form in this area. A higher percentage might be expected, for example if this was a military or religious centre or a major urban centre. The general paucity of samian and other specialised vessels such as mortaria, flagons and other fine ware imports and the preponderance of local native wares and Severn Valley wares would argue against this assemblage being of military origin.

Discussion

The pottery recovered is consistent with that to be expected from an early Roman rural settlement in this area. The site shows many parallels for example with the double-ditched enclosure investigated at Meole Brace, near Shrewsbury (Bain 2007). Although there was pre-Roman Iron Age activity at this site the Meole Brace enclosure dates to the early Roman period and seems to have been predominantly in use in the first and second centuries and abandoned around the same time as Craven Arms. The range of pottery documented at Meole Brace also shows many parallels with basically

the same spectrum of wares as Craven Arms. This seems to be the norm for many of the sites investigated in the Wroxeter hinterland (Evans 2007).

ANALYSIS OF ENVIRONMENTAL SAMPLES

By Dawn Elise Mooney 2013

Introduction

Twelve bulk samples were taken during archaeological excavations at the site to recover environmental remains such as charred plant macrofossils, wood charcoal, fauna and mollusca, to assist finds recovery, and to assess potential for scientific dating. Samples 5, 6 and 7 were taken from the fills of oven feature F53, while samples 11, 12 and 13 were taken from the fills of pit F77 adjacent to this feature. A further sample (not numbered) was taken from the upper fill (10007) of oven F10006. Sample 9 originated from a secondary fill (66) of structural ditch F69, while samples 8 and 10 were taken from dump deposits infilling the top of this ditch. Samples 18 and 19 originated from the secondary fill (11008) and basal fill (11009) respectively of pit F11010. These last two samples contained no charred botanical remains of any significance, and as such are not included in this analysis. Following assessment of these samples, further work was recommended to catalogue the macrobotanical and charcoal remains present in the relatively large assemblage recovered from sample 7. The results of this analytical work are presented in this report, alongside a summary of the results of the assessment of all twelve samples, in order to discuss the implications of the assemblage for diet, agriculture, fuel use and environment at the site.

Methodology

The bulk soil samples were processed in their entirety in a flotation tank, and the flots and residues were retained on 500 μ m and 250 μ m meshes respectively and air dried prior to sorting. The residues were passed through graded sieves (8, 4 and 2mm) and each fraction sorted for environmental and artefact remains. The flots were scanned under a stereozoom microscope at x7–45 magnifications and an overview of their contents recorded. Identifications of macrobotanical remains were made using modern comparative material and reference texts (Cappers *et al.* 2006, Jacomet 2006, Jones *et al.* 2004), and are recorded in Table 5. Charcoal fragments were fractured along three planes (transverse, radial and tangential) according to standardised procedures (Gale and Cutler 2000). Specimens were viewed under a stereozoom microscope for initial grouping, and an incident light microscope at magnifications up to 400x to facilitate identification of the woody taxa present. Taxonomic identifications were assigned by comparing suites of anatomical characteristics visible with those documented in

Table 5. Plant species identification

	Period	Roman									
		5	6	7	8	9	10	11	12	13	
Sample number		52	63	64	65	66	70	74+75+76	74	76	
Context		F53	F53	F53	F69	F69	F69	F77	F77	F77	
Parent context		HE	HE	HE	D/ED	D	D/ED	P	P	P	
Feature type		10	5	15	5	5	<5	15	5	10	
Flot volume (ml)		2	<2	6	<2	<2	<2	2	<2	<2	
Flot weight (g)											
Taxonomic identification	English name										
Crop cereals											
<i>Triticum diocum/spelta</i>	emmer/spelt wheat caryopses	-	-	72	-	-	-	-	-	-	
<i>Triticum aestivum</i> sp.	bread wheat caryopses	-	-	17	-	-	-	-	-	-	
<i>Triticum</i> sp.	wheat caryopses	9	-	21	1	1	2	9	-	7	
<i>Hordeum vulgare</i>	barley caryopses	-	-	89	-	-	-	-	-	-	
<i>Hordeum</i> sp.	barley caryopses	-	-	11	-	-	1	1	-	-	
<i>Avena</i> sp.	oat caryopses	-	-	39	-	-	-	1	-	-	
Cerealia indet.	indet. cereal caryopses	-	1	199	-	-	2	14	2	4	
chaff	-	-	-	-	-	-	-	-	-	-	
<i>Triticum spelta</i>	spelt wheat glume base	-	-	1	-	-	-	-	-	-	
indet. rachis fragment	-	-	-	1	-	-	-	-	-	-	
detached cereal embryo	-	-	-	3	-	-	-	-	-	-	
indet. chaff	-	-	-	5	-	-	-	-	-	-	
indet. stem fragments (cf. Poaceae)	possible grass stem fragments	-	-	1	-	2	-	-	-	-	
Wild grasses, arable weeds and waste ground											
Poaceae	large caryopses	-	-	6	-	-	-	-	-	1	
Poaceae	small caryopses	2	2	5	-	-	1	11	5	1	
cf. <i>Bromus</i> sp.	brome	-	-	27	-	-	-	-	-	-	
<i>Avena/Bromus</i>	oat/brome	-	-	74	-	-	-	-	-	-	
cf. <i>Trifolium</i> sp.	clover	-	-	-	-	-	-	-	-	1	
<i>Polygonum</i> cf. <i>aviculare</i> L.	knotgrass	-	-	1	-	-	-	-	-	-	
<i>Polygonum lapathifolium</i>	pale persicaria	-	-	1	-	-	-	-	1	-	
<i>Polygonum/Rumex</i> sp.	-	-	-	-	-	1	1	4	-	-	
<i>Asperula arvensis</i>	blue woodruff	-	-	1	-	-	-	4	-	-	
<i>Veronica</i> sp.	speedwell	2	-	1	-	-	-	-	-	-	
<i>Papaver</i> sp.	poppy	-	-	-	-	-	-	-	-	1	
Asteraceae	Compositae/daisy family	-	-	2	-	-	-	-	-	-	
<i>Tripleurospermum inodorum</i> (L.) Sch.Bip.	scentsless mayweed	-	-	3	-	-	-	-	-	-	
<i>Arrhenatherum elatius</i> var. <i>bulbosum</i>	couch grass tuber	-	-	-	-	-	-	1	-	-	
Wild/weed plants common to wet ground											
<i>Alchemilla</i> sp.	lady's mantle	-	-	1	-	-	-	-	-	-	
<i>Carex</i> sp.	sedges lenticular	-	-	-	-	1	-	2	-	-	
<i>Carex</i> sp.	sedges triangular/round	-	-	1	-	-	-	-	-	-	
Indeterminate or unidentified plant parts											
Unidentified weed seed											
		1	-	-	-	1	1	-	-	1	

Feature-type key: HE = hearth/oven; D = ditch; ED = dump deposits in top of ditch ; P = pit

reference atlases (Hather 2000, Schoch *et al.* 2004), and by comparison with modern reference material held at the Institute of Archaeology, University College London. Identifications have been given to species where possible, however genera, family or group names have been given where anatomical differences between taxa are not significant enough to permit satisfactory identification. Nomenclature used follows Stace (1997), and taxonomic identifications of charcoal are recorded in Table 6.

Results

Hearth/Oven features F53: samples 5, 6, 7; F77: samples 11, 12, 13; (10007)

Samples 5, 6, and 7 originated from the fills of oven F53. While like those from pit features the flots of most samples were dominated by uncharred modern material, sample 7 only contained a few small rootlets and was composed mostly of charred cereal grains. The preservation of these grains was generally poor, with many being broken, pitted and distorted. As such, just under half of the caryopses present could not

Table 6. Charcoal identification.

	Period	Roman			
		7	9	9	-
Sample number		7	9	9	-
Context		64	66	66	10007
Parent context		F53	F69	F69	F10006
Feature type		HE	D	D	HE
Taxonomic Identification	English name				
<i>Quercus</i> sp.	oak	14	2	2	10
<i>Fraxinus excelsior</i>	ash	-	2	2	-
cf. Maloideae	hawthorn, whitebeam, rowan, apple, pear	3	-	-	-
<i>Prunus</i> sp.	cherry/blackthorn	60	-	-	-
<i>Corylus avellana</i>	hazel	3	-	-	-
cf. <i>Cornus sanguinea</i>	dogrose	3	1	1	-
Leguminosae	gorse, broom	2	3	3	-
indet. bark	-	5	-	-	-
indet. distorted	-	20	-	-	-

Feature-type key: HE = hearth/oven; D = ditch

be identified. The remainder of the assemblage was approximately evenly split between wheat (*Triticum* sp.) and barley (*Hordeum* sp.), with some only identifiable as wheat/barley (*Triticum/Hordeum*). The barley caryopses were hulled, and the ratio of straight to twisted grains suggests that they originate from a six-rowed variety. However, it should also be noted that twisting of grains can also occur during the charring process. Most of the wheat grains were identified as spelt/emmer (*Triticum spelta/dicoccum*), however probably bread wheat (cf. *Triticum aestivum*) was also noted. Small numbers of wheat and barley grains were also noted in samples 5 and 6. Cereal chaff was rare in the assemblage. A single spelt (*Triticum spelta*) glume base was recorded, along with an indeterminate cereal rachis node and internode and a fragment of cereal/grass stem. A small number of detached embryos/coleoptiles of wheat or barley were also present.

The plant macrofossil assemblage from sample 7 also contained a significant number of oat (*Avena* sp.) and brome (*Bromus* sp.) caryopses. The assemblage seems approximately evenly split between the two taxa, however a large proportion of the grains could only be identified as oat/brome (*Avena/Bromus*). In the absence of any chaff it is not possible to see whether the oat grains derive from a cultivar or from a wild species. A variety of other wild seeds were also recorded in samples 5, 6 and 7, including speedwell (*Veronica* sp.), pale persicaria (*Polygonum lapathifolium*), common knotweed (*Polygonum aviculare*), blue woodruff (*Asperula arvensis*), lady's mantle (cf. *Alchemilla* sp.), scentless mayweed (*Tripleurospermum inodorum*), seeds of the daisy family (Asteraceae), sedges (*Carex* sp.) and grasses (Poaceae).

Samples 11, 12 and 13 from the fills of stoke-hole F77 adjacent to kiln/oven F53 produced small quantities of cereal grains including wheat and barley, which again were generally poorly preserved. A single oat

grain was also found in sample 11, which may be from a wild or cultivated variety. Small numbers of wild seeds were also present, including grasses, knotweed/dock (*Polygonum/Rumex*), blue woodruff, sedge, poppy (*Papaver* sp.), clover (*Trifolium* sp.), and pale persicaria (*Persicaria lapathifolia*). A possible charred couch grass (cf. *Arrhenatherum elatius* var. *bulbosum*) tuber was also noted in sample 11.

Small quantities of wood charcoal were observed in the above samples. Charcoal from sample 7 was dominated by cherry/blackthorn (*Prunus* sp.) fragments, although oak (*Quercus* sp.), hazel (*Corylus avellana*) and dogwood (*Cornus* sp.) were also present. Additionally, wood of the Leguminosae family (likely to represent either gorse (*Ulex europaeus*) or broom (*Cytisus scoparius*) was noted, along with wood of the Maloideae family, which includes hawthorn (*Crataegus monogyna*), rowan, service and whitebeam (*Sorbus* sp.), apple (*Malus* sp.) and pear (*Pyrus* sp.). Amongst the assemblage small roundwood was common, especially of cherry/blackthorn and oak. Fragments of charred bark were also recorded. The preservation of the charred wood remains was generally poor, with many fragments displaying distortion or vitrification linked to the charring process. For this reason, numerous charcoal fragments from the sample could not be assigned taxonomic identifications. Wood anatomical analysis of the charcoal from pit fill (10007) revealed this assemblage to comprise only oak fragments.

Structural ditch F69: samples 8, 9, 10

Samples 8 and 10 originated from dump deposits (65) and (70) infilling the top of structural ditch F69, while sample 9 was taken from a secondary fill (66) of the same ditch. All were dominated by uncharred modern material. Small numbers of poorly-preserved cereals including wheat and barley were also noted, along with wild seeds including grasses, sedge and knotweed/

dock. Two charred grass/cereal culm nodes were also recorded in sample 9. Small to moderate assemblages of wood charcoal in samples 9 and 10 were assessed for taxonomic composition, and found to comprise Leguminosae, ash (*Fraxinus excelsior*), oak and wild clematis (*Clematis vitalba*) fragments.

Discussion

Environment and diet

The quantities of cereal grain recovered from the site indicate strongly that crops such as wheat and barley, and possibly also oats, were being grown in an arable landscape in the vicinity of the site. However, the presence of only very small quantities of cereal chaff indicates the grain was not being processed on site. There was no evidence for the cultivation of other crops such as pulses or legumes, however this bias is likely to result from the provenance of samples from features associated with ovens, and that these crops are less likely to come into contact with fire during processing. The wild taxa recorded in these samples probably derive from either seeds brought in accidentally with the grain assemblage, or from plants accidentally included with the fuel wood, growing either in the areas exploited for fuel acquisition or close to the ovens. Most of the charred seeds recorded, such as grasses, speedwell, mayweed, knotweed/dock, woodruff and clover are common in anthropogenic environments such as pastures, cultivated land and wasteland. Seeds of pale persicaria, lady's mantle and sedges may indicate the presence of wetland or wetland margin environments, however these are few in number and are also found on cultivated ground and grassland.

Although cereal grain assemblage from the site contained a large quantity of unidentifiable cereal grains, a significant number were identified as wheat and barley. The wheat caryopses were mostly of spelt/emmer, however a small quantity of free-threshing bread wheat was also noted. The barley grains are likely to have derived from a six-rowed hulled variety. This mix of cereals is typical of Roman sites in southern Britain (cf. van der Veen 1989, Straker 1999, Helbaek 1964, Caseldine and Busby 1993, Stevens 2008, Campbell 2008). Oat grains were also common, however in the absence of any chaff remains it is impossible to distinguish whether these result from wild species or cultivars (Jacomet 2006). Brome caryopses, which are similar to oat grains, were also frequently noted. The presence of oat and/or brome caryopses has also been noted in grain assemblages from other Roman sites. At Caerleon in south Wales (Helbaek 1964), it is suggested that these taxa are wild species rather than cultivars, as while cereal grains from the same context were found to be sprouted, the oat and brome caryopses were not, which suggests unintentional inclusion. Additionally, at the Former County Hospital, Dorchester, assemblages of grain with significant quantities of oat and brome

caryopses also contained wild oat (*Avena fatua*) floret bases, indicating that the oats are again likely to be wild rather than cultivated. The oat/brome component of the assemblage from Craven Arms is therefore likely to represent wild taxa which were not removed during crop processing due to their similar size to cereal grains.

The large quantity of cereal grain in features F53 and F77 suggests that the ovens at the site may have been used for drying grain. It is also possible that the cereal remains arrived in the ovens by way of straw being used as kindling. However, the large quantity of grains recovered compared to the paucity of cereal chaff make this interpretation unlikely. Corn-drying ovens can be utilised for a number of purposes, however the lack of cereal chaff and relative infrequency of wild seeds in these assemblages suggests that these may have been used for the drying of fully processed grain, prior to either storage or milling (van der Veen 1989). Such ovens are also used in the process of malting barley, wherein germinated grain is roasted to halt the germination process prior to the use of the grain in brewing (*ibid.*). While detached cereal grain coleoptiles, which can be an indicator of sprouting, were noted in small quantities in sample 7, none of the barley grains present showed signs of germination. It is therefore unlikely that this oven was used in barley malting.

While the oven F53 does not fit the most common T-shaped form of Roman corn dryers, there is known variability in these features. Most similar to the oven at Craven Arms are 'cigar-shaped' corn dryers found at Scamblesby (Brown and Field 1988, cited in Tipper 1994) and Cawkwell (Carruthers 1989, cited in van der Veen 1989) in Lincolnshire. The charred plant assemblage from the Cawkwell ovens was similar to that found at Craven Arms, with a mixture of wheat and barley and no evidence of germination of grain. These are interpreted as ephemeral, rural ovens of a local type (Tipper 1994), and oven F53 may represent this kind of feature. There are few published examples of Roman ovens which are interpreted as having not been used for corn drying. Figure-of-eight shaped ovens from Bromfield in Shropshire were found to contain low quantities of cereal grains, chaff and other plant macrofossils, and it has been suggested that these were used primarily for cooking (Hughes *et al.* 1995). Compared to these examples, the features at Craven Arms do seem likely to have been used at least in part for corn drying. However, grain assemblages are also known from bread ovens in the medieval period (Schuster and Stevens 2009). These assemblages of processed grain are suggested to originate from the use of cereal grain either to line the oven base to prevent the bread sticking, or from grain thrown in to the oven to test the temperature. Although the examples given by Schuster and Stevens (2009) are much later than the features at Craven Arms, similar practices may have been employed at the site.

Fuel

The preservation of charcoal overall at the site was generally poor to moderate, with fragments abraded and showing evidence of sediment infiltration and concretion linked to fluctuations in groundwater level. As most of the samples originated from ovens or pits immediately associated with these features, and the charcoal found therein probably comprised the remains of fuel wood used in the ovens. However, the samples taken from dump deposits (65) and (70) result from secondary deposition of burnt material, and are likely to contain material from a number of burning events of various purposes.

Generally, the charcoal assemblages recovered from the environmental samples were small, although samples 7, 9, 10 and (10007) produced assemblages of a large enough size to merit assessment for taxonomic composition. Samples 7, 9 and 10 produced charcoal fragments of a similar range of taxa, comprising cherry/blackthorn, gorse/broom, dogwood, oak, ash and wild clematis. These taxa indicate that a variety of environments were being exploited for fuel procurement including deciduous woodland (oak and ash), woodland margin or hedgerow environments (cherry/blackthorn, dogwood and wild clematis), and scrub/heathland (gorse and broom). These taxa are likely to have been found in the local area surrounding the site, however as many other taxa would also have been growing locally it is likely that these woods were selected as fuel. Additionally, a similar range of taxa was identified from Romano-British features at Perry Oaks (Challinor 2006), which may indicate continuity of fuel wood selection over a wide region. Small roundwood and twig fragments were common in all samples, which suggests that brushwood was being commonly utilised as fuel, possibly indicating adaptation of firewood collection strategies to periods of fuel shortage. However, the sample taken from oven fill (10007) contained only oak charcoal. Oak is known to be an excellent fuel wood, however it is also prized for use as timber in construction and joinery, and is unlikely to be used as fuel if it was in short supply (Taylor 1981, Rackham 1990). The exclusion of any other wood taxa from this deposit suggests that oak may have been specifically selected as fuel, and the disparity between this assemblage and those from samples 7, 9 and 10 may indicate that these assemblages derive from burning events from different purposes or periods.

Conclusion

Both charred plant macrofossils and wood charcoal from the site were often poorly preserved, however it has been possible to comment on agriculture and fuel use at the site and in the surrounding area. Barley, spelt/emmer and bread wheat are likely to have been cultivated near the site, however there is no indication of crop processing taken place on site. Fuel wood including brushwood from woodland, hedgerow and scrub

environments was used in oven F53, which contained remains of fully processed wheat and barley. This feature may have been used for a variety of purposes, including the drying of cereal grains prior to storage, the use of grain during cooking activities, and the burning of cereal waste.

RADIOCARBON DATING

By Dawn Elise Mooney

Introduction

Six samples were submitted to the Scottish Universities Environmental Research Centre, East Kilbride (SUERC) for radiocarbon analysis from Craven Arms Stokewood Road Depot CASR13. The radiocarbon dating programme was designed in order to provide a precise date for activity related to Roman oven/hearth feature F53. Two samples of charred botanical material from each of three contexts were submitted in order to reduce the probability of inaccurate dating based on residual or intrusive material. A single charred wheat (*Triticum* sp.) caryopsis and a fragment of Leguminosae family charcoal were submitted from both oven fill F64 and ditch fill F70, while a charred wheat caryopsis and blue woodruff (*Asperula arvensis*) seed were submitted from pit fill F74. These samples were submitted on the basis of recommendations made following the assessment of environmental material from the site in April 2014 (see Mooney above).⁴

Results

The radiocarbon dating results are given in Table 7, and are quoted in accordance with the international standard known as the Trondheim convention (Stuiver and Kra 1986). They are conventional radiocarbon ages (Stuiver and Polach 1977). 2 Sigma calibrated dates, obtained using IntCal04 (Reimer *et al.* 2004), are also given at the 95.4% and 68.2% confidence levels.

Discussion

The five samples which contained sufficient carbon for radiocarbon dating all indicate a mid first to early third century AD date for the features, indicating that the oven was in use in the mid Roman period. All five dates are very consistent with one another, indicating that none of the material submitted is likely to be residual or intrusive. Furthermore, the similarity of the results may indicate that all the material examined results from burning events within the same season. It is possible that the oven F53 from which the material is likely to originate was only in use for a very short period of time, and that the charred assemblages from it and its associated features were all formed within this period. However, it must also be considered that these assemblages may only relate to the last period of use of the oven, with material from previous usages having been cleaned out.

Table 7. Results of radiocarbon dating.

Laboratory ID	Sample ID	Material & context	$\delta^{13}\text{C}$ (‰)	Radiocarbon age (BP)	Calibrated date (95.4% confidence)	Calibrated date (68.2% confidence)
SUERC-53994	ASE_DS_00260	Charred <i>Triticum</i> sp. caryopsis from fill (64) of hearth/oven F53	-24.4	1923 ± 26	22-130 cal AD	55-90 cal AD (44.3%), 100-123 cal AD (23.9%)
SUERC-53995	ASE_DS_00261	Leguminosae charcoal from fill [(64) of hearth/oven F53	-24.8	1871 ± 29	73-225 cal AD	82-170 cal AD (59.0%), 194-210 cal AD (9.2%)
SUERC-53996	ASE_DS_00262	Charred <i>Triticum</i> sp. caryopsis from fill (70) of ditch F69	-24.4	1844 ± 29	86-239 cal AD	131-215 cal AD
SUERC-53997	ASE_DS_00263	Leguminosae charcoal from fill (70) of ditch F69	-22.8	1869 ± 29	75-225 cal AD	83-170 cal AD (58.4%), 194-210 cal AD (9.8%)
SUERC-53998	ASE_DS_00264	Charred <i>Triticum</i> sp. caryopsis from fill (74) of pit F77	-23.9	1891 ± 29	56-215 cal AD	70-134 cal AD
N/A	ASE_DS_00265	Charred <i>Asperula arvensis</i> seed from fill (74) of pit F77	N/A	Failed: insufficient carbon	N/A	N/A

OSL DATING – METHODOLOGY

By Jean-Luc Schwenninger⁵

Sampling for optically stimulated luminescence (OSL) dating (Huntley *et al.* 1985, Aitken 1998) was carried out using light-sealed stainless steel tubes hammered into exposed sections. In order to determine the attenuating effect of pore water on the environmental dose rate, additional soil samples were collected in the field and hermetically sealed. The modern moisture content of samples was determined in the laboratory by weighing the sample before and after oven drying at 50°C. These determinations formed the basis for the assessment of the mean water content of the samples throughout the burial period and were used in the dose rate calculations. Where possible, direct measurements of the natural ionizing radiation were obtained using a portable field gamma-ray spectrometer (EG&G Ortec Micronomad) calibrated against the Oxford blocks (Rhodes and Schwenninger 2007). Sample processing and luminescence measurements were made at the Research Laboratory for Archaeology and the History of Art, University of Oxford under low intensity laboratory lighting using purpose-built amber LED lighting (emitting at ~588nm). Further details regarding individual samples are presented in Table 10.

The laboratory procedures adopted for the optical dating were based on standard methodologies and designed to yield pure sand-sized quartz mineral grains. After removal of the exposed ends of the sampling containers, the unexposed central portion of the sample was wet-sieved to isolate the different constituent mineral size fractions. The preferred grain size (180-250µm) was treated with diluted hydrochloric acid (HCl) to remove carbonates and then placed in concentrated (48%) hydrofluoric acid for 90 minutes. This latter acid digestion serves to dissolve feldspar grains and to remove the outer rinds of quartz grains which are exposed during burial to

natural alpha radiation. Any heavy minerals present were subsequently removed by gravity separation using a sodium polytungstate solution at 2.68 g.cm⁻³. Finally, each sample was re-sieved to remove heavily etched smaller grains. The prepared quartz samples were mounted as multigrain aliquots on 9mm diameter aluminium discs using viscous silicone oil. The aliquot size was reduced to circa 5mm in order to improve the detection of poorly bleached grains through the spread and symmetry of individual palaeodose estimates.

Various tests for sample purity were made including exposure of grains to infrared (IR) light during OSL measurement. No prolonged etching in H₂SiF₆ was necessary as samples were found to have very low IRSL/OSL ratios (i.e IRSL <1% of OSL signal). Luminescence measurements were made using an automated Risø luminescence reader (Bøtter-Jensen 1988, 1997, Bøtter-Jensen *et al.* 2000). Optical excitation for determining the quartz OSL signal intensity was provided by filtered blue diodes (emitting ~470Δ20nm; ~32mW/cm²) and infrared stimulation was provided using an IR laser diode. Detection of the emitted quartz UV signal (~370 nm) was made using an EMI 9635Q photomultiplier tube filtered with a Hoya U340 glass filter. Laboratory doses used for constructing the dose response curves were provided by a ⁹⁰Sr/⁹⁰Y ceramic beta source housed within the reader and calibrated against a gamma irradiated Risø National Laboratory standard (Hansen *et al.* 2015).

All OSL measurements were made at a raised temperature of 125°C (to ensure no re-trapping of charge to the 110°C TL trap during measurement) for 100s. The dose equivalent (De) was determined from the first second of the OSL decay curve, using the final five seconds as background noise (total stimulation time was fifty seconds). The OSL signal was corrected for sensitivity using the signal regenerated by a small test dose and following the single aliquot regenerative-dose (SAR) measurement procedure described by Murray

Table 8. C14 dates.

Laboratory ID	Sample ID	Context ID and Description	Material	δ13C (‰)	Radiocarbon age (BP)	Calibrated Date (95% probability)
SUERC-53994	[64] <7>	fill (64) of Oven 1	charred grain (<i>Triticum</i> sp.)	-24.4	1923±26	cal AD 20–130
SUERC-53995	[64] <7>	fill (64) of Oven 1	wood charcoal (Leguminosae)	-24.8	1871±29	cal AD 70–225
SUERC-53996	[70] <10>	dump deposit (70) at top of structural trench F69	charred grain (<i>Triticum</i> sp.)	-24.4	1844±29	cal AD 85–240
SUERC-53997	[70] <10>	dump deposit (70) at top of structural trench F69	wood charcoal (Leguminosae)	-22.8	1869±29	cal AD 75–225
SUERC-53998	[74] <11>	fill (74) of a stoke hole & rake-out pit F77 contemporary with use of Oven 1	charred grain (<i>Triticum</i> sp.)	-23.9	1891±29	cal AD 55–215

Table 9. OSL dates.

Lab ID	Sample ID	Context ID and Description	Luminescence age (years before AD 2013)	Calendrical bandwidth (95% confidence)
X6098	OSL 1	Pit 44 primary fill (43), lowest part	2100 ± 220a	530 BC–AD 360
X6099	OSL 2	Pit 44 primary fill (43), upper part	2150 ± 190a	520 BC–AD 250
X6100	OSL 3	Pit 44 secondary fill (42)	1780 ± 240a	250 BC–AD 720
X6102	OSL 5	Ditch B recut phase 4 (56)	1730 ± 160a	40 BC–AD 610
X6103	OSL 6	Ditch B primary fill (58)	2040 ± 270a	570 BC–AD 520
X6105	OSL 8	Oven clay lining (53)	2040 ± 180a	390 BC–AD 340
X6108	OSL 15	Oven clay lining (53)	1930 ± 140a	200 BC–AD 370

Table 10. Summary of the OSL dating. The results are based on luminescence measurements of sand-sized quartz grains (180-255µm) mounted on 5mm aliquots. All samples were measured using an automated Riso luminescence reader using a SAR post-IR blue OSL measurement protocol

Sample ID	Lab ID	Radioisotopes†			Field water ppm	External γ-dose rate§ (Gy/ka)	Cosmic dose rate (Gy/ka)	Total dose rate (Gy/ka)	Palaeodose (Gy)	OSL (years before AD 2013)
		K %	Th ppm	U ppm						
OSL 1	X6098	1.49	9.4	2.4	17.0	0.937 ± 0.04	0.180 ± 0.015	2.37 ± 0.12	4.97 ± 0.47	2100 ± 220
OSL 2	X6099	1.40	9.0	2.4	19.3	0.886 ± 0.044	0.189 ± 0.017	2.24 ± 0.11	4.81 ± 0.35	2150 ± 190
OSL 3	X6100	1.45	9.3	2.5	18.7	0.943 ± 0.047	0.196 ± 0.020	2.34 ± 0.11	4.17 ± 0.52	1780 ± 240
OSL 5	X6102	1.72	10.4	2.6	18.6	0.963 ± 0.048	0.183 ± 0.015	2.53 ± 0.13	4.37 ± 0.33	1730 ± 160
OSL 6	X6103	1.68	10.3	2.5	16.7	0.924 ± 0.046	0.193 ± 0.018	2.50 ± 0.13	5.10 ± 0.61	2040 ± 270
OSL 8	X6105	1.74	10.0	2.3	15.0	(0.950 ± 0.048)	0.180 ± 0.015	2.57 ± 0.14	5.25 ± 0.37	2040 ± 180
OSL 15	X6108	2.15	10.3	2.4	13.8	(0.950 ± 0.048)	0.180 ± 0.015	2.85 ± 0.16	5.49 ± 0.25	1930 ± 140

† Measurements were made on dried, homogenised and powdered material by fusion ICP-MS with an assigned systematic uncertainty of ±5%. Dry beta dose rates calculated from these activities were adjusted for the saturation field water content expressed as a percentage of the dry mass of the sample.

§ Based on *in-situ* measurements using a portable γ-ray spectrometer equipped with a 3x3 inch NaI (TI) scintillator crystal and calibrated against the Oxford calibration blocks (Rhodes and Schwenninger 2007). For samples X6105 and X6108 no *in-situ* measurements could be made and the external dose rate was estimated from two nearby spectra.

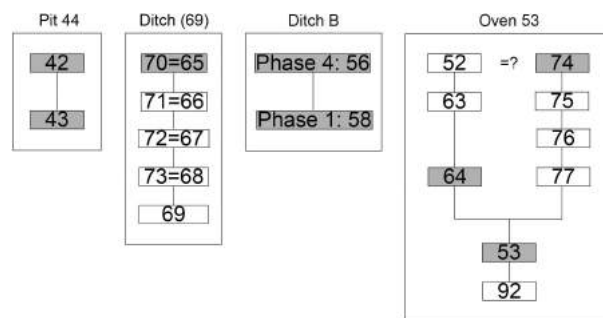


Figure 27. Context matrix: dated samples come from contexts in grey.

and Wintle (2000) and Wintle and Murray (2006). To ensure removal of unstable OSL components, removal of dose quenching effects, and to stimulate re-trapping and ensure meaningful comparison between naturally and laboratory irradiated signals, pre-heating was performed prior to each OSL measurement. Following each regenerative dose and the natural dose, a pre-heat at 250°C for 10s was used. Following each test dose, a pre-heat of 220°C for 10s was applied. All OSL measurements additionally incorporated a post-IR blue OSL stage in which each OSL measurement is preceded by an IRSL measurement at 50°C, to reduce the potential effects of any residual feldspar grains (Banerjee *et al.* 2001). For each sample a set of twelve multigrain aliquots were measured.

The concentrations of radioisotopes (potassium, thorium and uranium) within the sediment were derived from elemental analysis by ICP-MS/AES using a fusion sample preparation technique. The concentrations of parent isotopes were converted to dose rates according to the updated attenuation factors proposed by Adamiec and Aitken (1998), corrections for grain size (Mejdahl 1979) as well as water content (Zimmermann 1971). The cosmic-ray dose was calculated according to data reported by Prescott and Hutton (1994), taking into account the thickness and density of the overburden as well as the geomagnetic latitude and elevation of the site. The palaeodose was obtained using a central age model (CAM) and a systematic laboratory reproducibility uncertainty of 4% was added to the measurement uncertainty to account for uncertainties in instrument reproducibility and calibration of the beta source.

The yield of sand-sized quartz mineral grains derived from the samples was very good and the prepared aliquots also showed excellent response to laboratory irradiation (sensitivity). The initial signal intensity and the form of the decay curve show a fast decrease in OSL intensity which is characteristic of quartz. This is further evidenced by a well-defined 110°C TL peak and stimulation using infrared (IR) light also confirmed the purity of each aliquot with negligible contributions from potential feldspathic contaminants (<0.1%). In the SAR measurements a low irradiation dose was repeated (recycling point) at the end of the measurement cycle to test how well the sensitivity correction procedure was working. If the sensitivity correction is adequate then the ratio of the signal from the repeated dose to that of the initial regeneration dose should fall within the range of 0.9–1.10. Excellent recycling ratios close to unity were recorded for all the samples analysed in this study. A further test on the recuperation (thermal transfer) also showed that no significant recuperation of the OSL signal was detected. Dose response curves generally always pass through the origin when a ‘zero’ dose is included thus indicating that thermal transfer of charge from optically insensitive traps into OSL traps is not an issue.

These favourable signal characteristics combined with the low spread in individual palaeodose estimates provide considerable support for the veracity of the calculated OSL age estimates and their associated errors. A summary of the radioactivity data and the luminescence results is presented in Table 10.

ANALYSIS OF RADIOCARBON AND OSL DATING By Anthony Krus (SUERC)

Introduction

Five radiocarbon and seven OSL measurements from archaeological contexts are available from the archaeological settlement at the Craven Arms depot, Shropshire. The radiocarbon results are from single-entity samples of charred grain and wood charcoal submitted to the Scottish Universities Environmental Research Centre (SUERC).

The charred grain and wood charcoal samples were pretreated with acid-base-acid pretreatment (Stenhouse and Baxter 1983). Samples were combusted in the manner described by Vandeputte *et al.* (1996) and graphite targets were prepared and measured following Naysmith *et al.* (2010). SUERC maintains rigorous internal quality assurance procedures, and participation in international inter-comparisons (Scott 2003) indicates no laboratory offsets; thus validating the measurement precision quoted for the radiocarbon ages.

Conventional radiocarbon ages (Stuiver and Polach 1977) are presented in Table 8, where they are quoted in accordance with the Trondheim convention (Stuiver and Kra 1986). Calibrated date ranges were calculated using the terrestrial calibration curve of Reimer *et al.* (2013) and OxCal v4.2 (Bronk Ramsey 1995, 1998). The date ranges in Table 8 have been calculated using the maximum intercept method (Stuiver and Reimer 1986), and quoted with the endpoints rounded outward to 10 years. The probabilities shown in Figure 28 were calculated using the probability method of Stuiver and Reimer (1993).

The OSL sampling was undertaken by Jean-Luc Schwenninger at the Luminescence Dating Laboratory at the Research Laboratory for Archaeology and the History of Art, University of Oxford using standard preparation procedures. While a final report on the Craven Arms OSL dating is forthcoming, the OSL methods are provided above, and the results presented in Tables 9 and 10. They are based on a combination of the field gamma-ray spectroscopy measurements and laboratory based ICP-MS analysis.

Methodology

The chronology of Craven Arms has been interpreted using a Bayesian approach (Buck *et al.* 1996). Although calibrated dates are accurate estimates for the dates of the samples, in this case we are interested in the

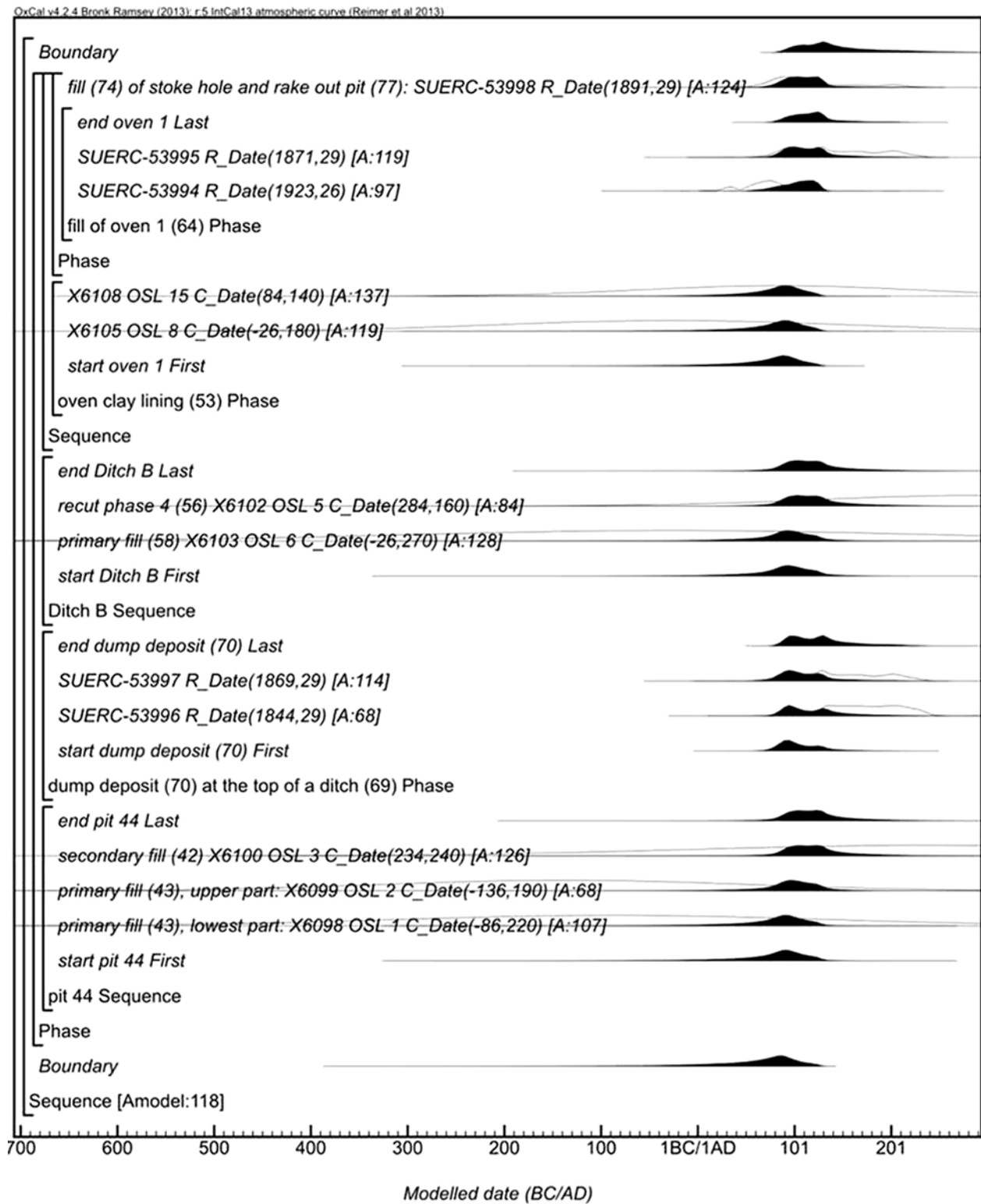


Figure 28. Results and structure of the Bayesian chronological model. For each of the radiocarbon measurements two distributions have been plotted, one in outline, which is the result of simple radiocarbon calibration, and a solid one, which is based on the chronological model use. The other distributions correspond to aspects of the model. The square brackets along with the OxCal keywords define the overall model exactly.

timing of the Roman and prehistoric activity. The date of this activity is estimated by using information from radiocarbon measurements on samples and sample context.

Methodology is now available which combines this information to produce realistic estimates of the dates of archaeological interest. The output of the modelling is the *posterior density estimate*. These are not absolute

but are instead interpretive *estimates* that can and will change as further data become available. Posterior density estimates are usually presented in *italics* to separate modelling and calibration results.

The methodology has been applied using the program OxCal v4.2, which uses a form of Markov Chain Monte Carlo sampling. Details and algorithms used in this process are described in Bronk Ramsey (1995, 1998, 2001, 2009).

The Samples and Models

Excavations at Craven Arms have identified a large square ditch enclosure and have recovered evidence for Roman and prehistoric activity. The excavations have identified two ovens, deep foundation slots for a probable building, at least three pits, and several phases of intercutting ditches. Diagnostic pottery from the second phase of Ditch B (27) and pit 44 suggest a date of the second century AD.

Two OSL results are available from the primary fill (43) of pit 44. OSL 1 (X6098) is from the lower part of the primary fill and OSL 2 (X6099) is from the upper part of the primary fill. An OSL result (OSL 3, X6100) is also available from the secondary fill (42) of pit 44.

Two radiocarbon results (SUERC-53996, SUERC-53997) are available from single-entities of charred grain (*Triticum* sp.) and wood charcoal (*Leguminosae*), respectively, from a dump deposit (70) at the top of structural ditch F69. This dump deposit was dominated by uncharred modern material but included small numbers of poorly-preserved cereals and an assemblage of wood charcoal, suggesting that it may have formed soon after a burning event. It is feasible that these two samples are the same age, as the measurements pass a chi-square test ($T=0.4$; $df=1$; $T'(0.05)=3.8$).

An OSL result (OSL 6 X6103) is available from the primary fill (58) of Ditch B, and an additional OSL result (OSL 5 X6102) is available from a Ditch B, Phase 4, recut (56).

Two OSL results (OSL 8 X6105, OSL 15 X6108) are from the clay lining (53) of Oven 1. It is feasible that these luminescence measurements are the same age, as the measurements pass a chi-square test ($T=0.2$; $df=1$; $T'(0.05)=3.8$).

Two radiocarbon results (SUERC-53994, SUERC-53995) are available from single-entities of charred grain (*Triticum* sp.) and wood charcoal (*Leguminosae*), respectively, from the primary fill and firing event (64) of Oven 1. It is feasible that these two samples are the same age, as the measurements pass a chi-square test ($T=1.8$; $df=1$; $T'(0.05)=3.8$).

A radiocarbon result (SUERC-53998) is available from a single-entity of charred grain (*Triticum* sp.) from the upper fill (74) of the stoke-hole and rake out pit, F77, contemporary with the use of Oven 1.

The algorithm used for this model can be directly derived from the dating matrix (Figure 27) and model

structure (Figure 28). The radiocarbon and OSL dates are in good agreement with the model assumptions ($A_{model}=117.5$). The model estimates that activity at the site began in *100 cal BC–cal AD 135 (95% probability; Figure 28; Boundary Start)* and probably *cal AD 35–120 (68% probability)*. The modelling estimates that activity on the site ended in *cal AD 80–255 (95% probability; Figure 28; Boundary End)* and probably *cal AD 90–165 (68% probability)*. The modelling estimates that activity on the site spanned *1–320 years (95% probability)*, probably *1–115 years (68% probability)*.

Discussion

The Bayesian model for the site provides posterior probability estimates for the starting and ending of site activity, a span for the site, and refined starting and ending estimates for the individual dated features (Figure 28). The model largely reaffirms the notion that this is a Roman site, with activity beginning in *cal AD 35–120 (68% probability; Figure 28; Boundary Start)* and ending in *cal AD 90–165 (68% probability; Figure 28; Boundary End)*.

It may be possible to enhance the chronological resolution for Craven Arms with further dating. More radiocarbon dates from samples that can be functionally related to their context should improve the precision of the chronological models. This positive effect of robust dating on archaeological chronologies is demonstrated in a study by Steier and Rom (2000) through computer simulation.

To understand the potential for future dating, a simulation was run with ten simulated radiocarbon dates spanning AD 100–150. With these simulated dates, the model estimates that activity at the site began in *cal AD 20–125 (95% probability)* and probably *cal AD 50–105 (68% probability)*. The modelling with simulated dates estimates that activity on the site ended in *cal AD 85–215 (95% probability)* and probably *cal AD 95–175 (68% probability)*. The modelling with simulated dates further estimates that activity on the site spanned *1–180 years (95% probability)*, probably *1–95 years (68% probability)*. This simulation clearly demonstrates that more dating should enhance the chronological resolution for Craven Arms, as the posterior probabilities are more refined when the simulated dates are included.

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NOTES

1. Context numbers were assigned from 001–200 for the initial phase of work, context numbers from 10000 for the second phase of work in September 2013, and context numbers from 11000 for the watching brief in early 2014. For the sake of clarity leading zeros have been omitted in this report.
2. Car park constructed with backfill into the excavated archaeological features, geomembrane and c.200mm of made ground above the excavated archaeological level, then 290mm of ballast and 90mm of tarmac above
3. Cut/feature numbers are prefixed by F – e.g. F24. Context numbers are in ordinary brackets – e.g. (67). Test pits excavated through ditch features are identified by slot numbers, shown on the site plan and labelled as such on the section drawings.
4. Radiocarbon dating of the samples was carried out by SUERC in summer 2014, with results delivered on 16th July 2014. The laboratory maintains a continual programme of quality assurance procedures, in addition to participation in international inter-comparisons (Scott 2003). These tests indicate no laboratory offsets and demonstrate the validity of the measurement quoted.
5. Dr Jean-Luc Schwenninger. Head of Luminescence Dating Laboratory, Research Laboratory for Archaeology and the History of Art, University of Oxford, Dyson Perrins Building, South Parks Road, Oxford, OX1 3QY

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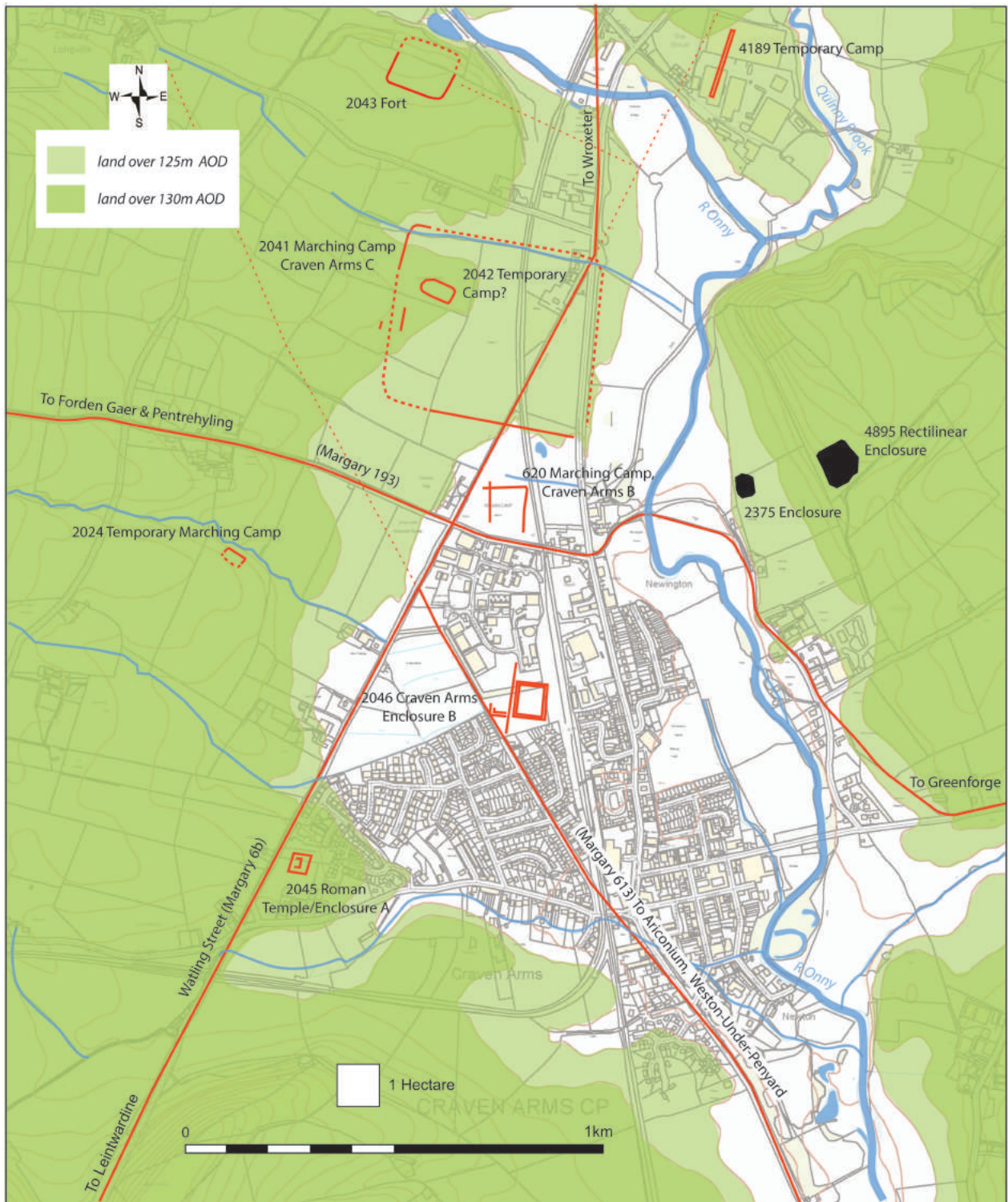
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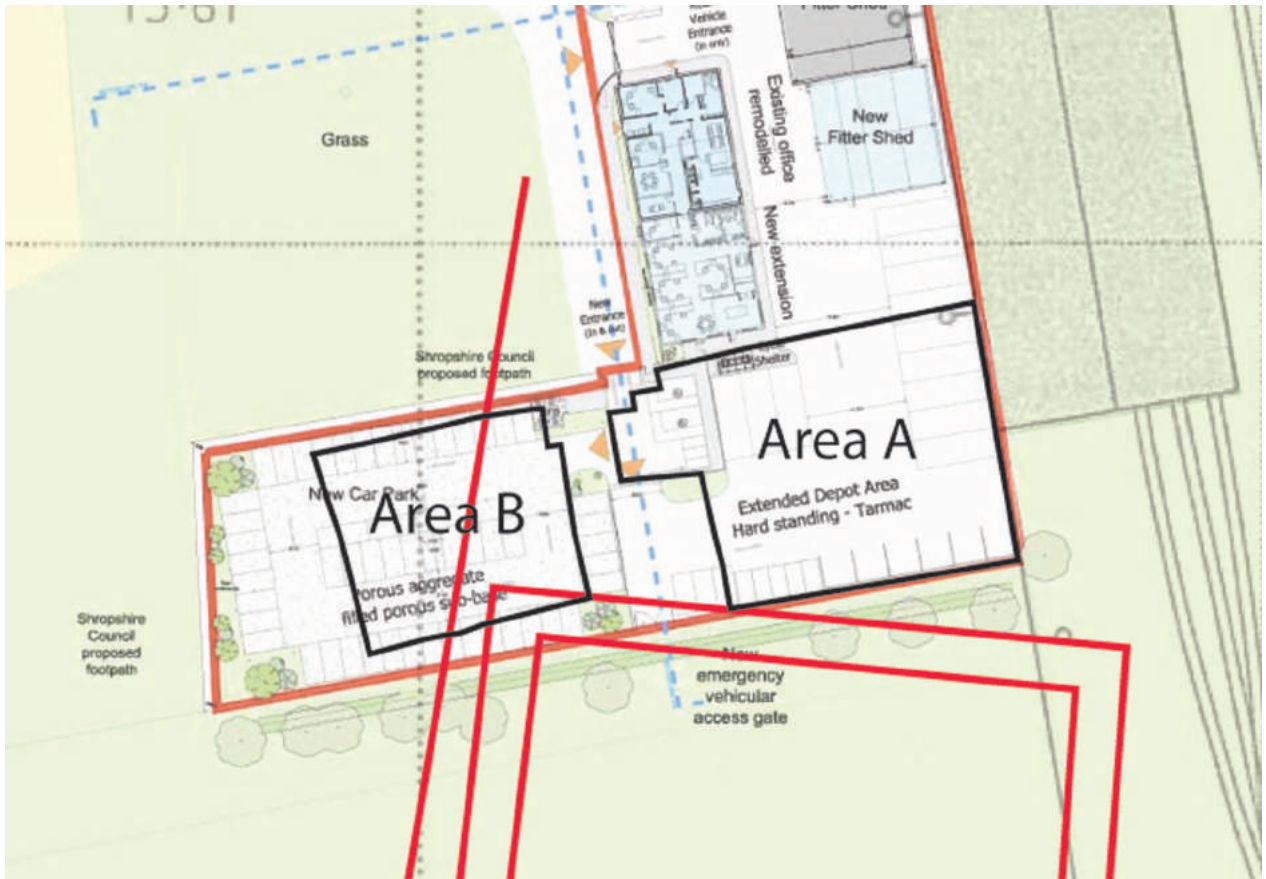
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Colour Plate 1. Location of Craven Arms B, showing higher ground either side of the river valley, Roman roads and cropmark enclosures, and the excavation site in the centre. *Created by Caroline Malim.*



Colour Plate 2. Detail of cropmark enclosure Craven Arms B, plotted against development area with 1975 OS map as backdrop.



Colour Plate 3. Development scheme (car parking) with excavation areas shown and northern part of cropmark enclosure.

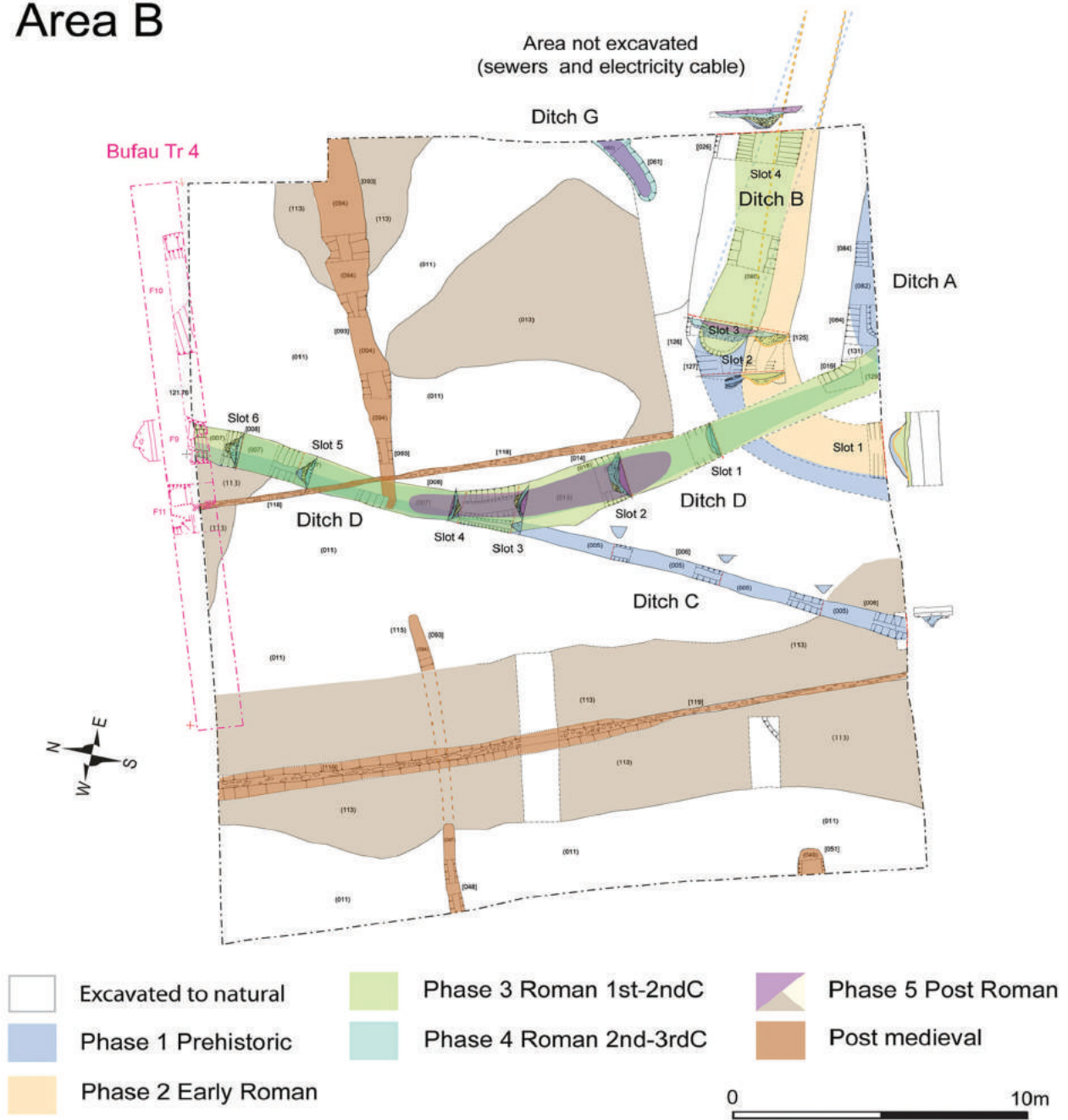


Colour Plate 4. Phased site plan showing all features, incorporating relevant 1991 BUFAU trenches.

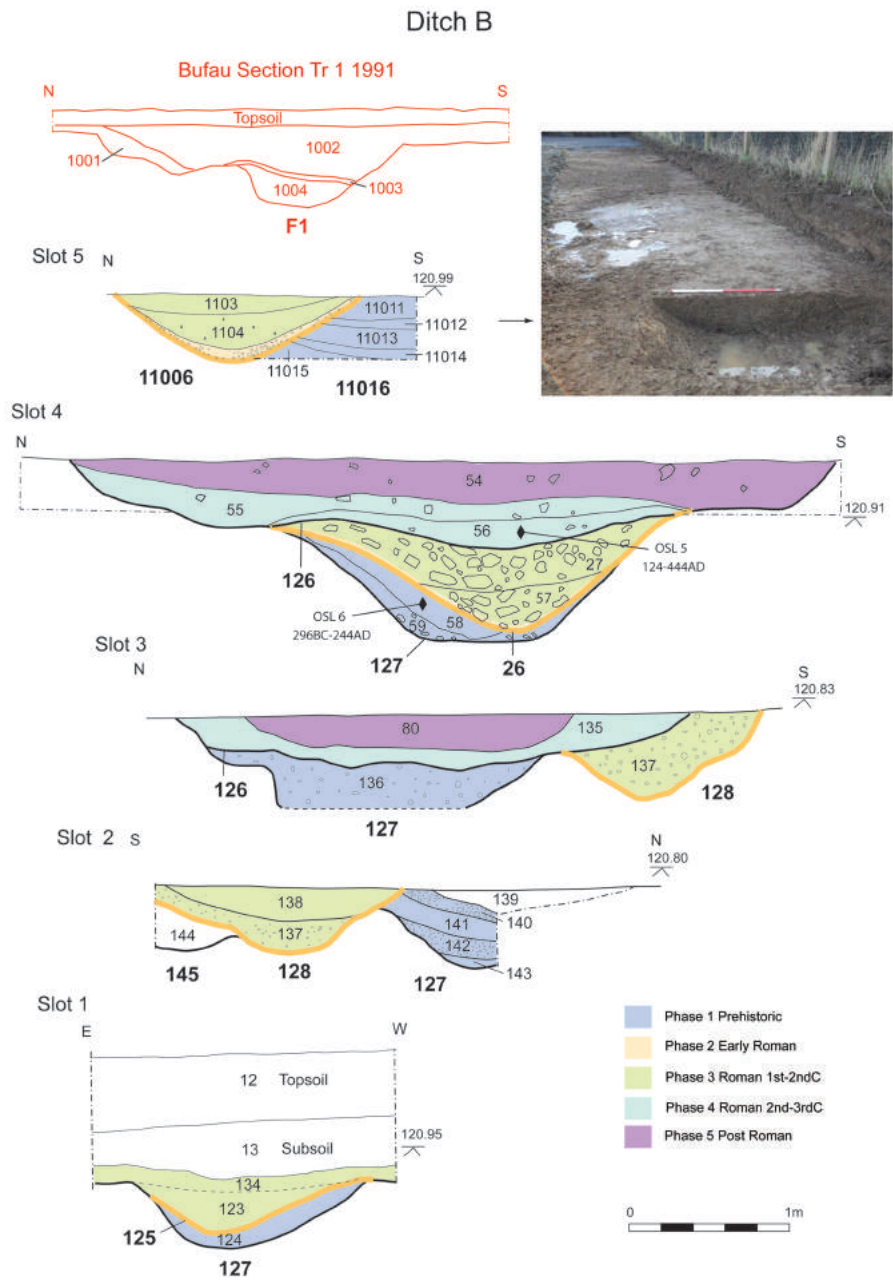


Colour Plate 4a. Phased site plan detail of Area A (with section through Ditch B superimposed).

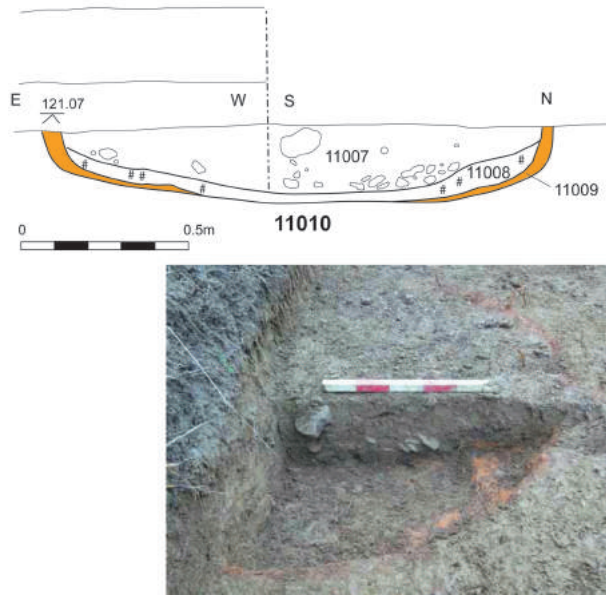
Area B



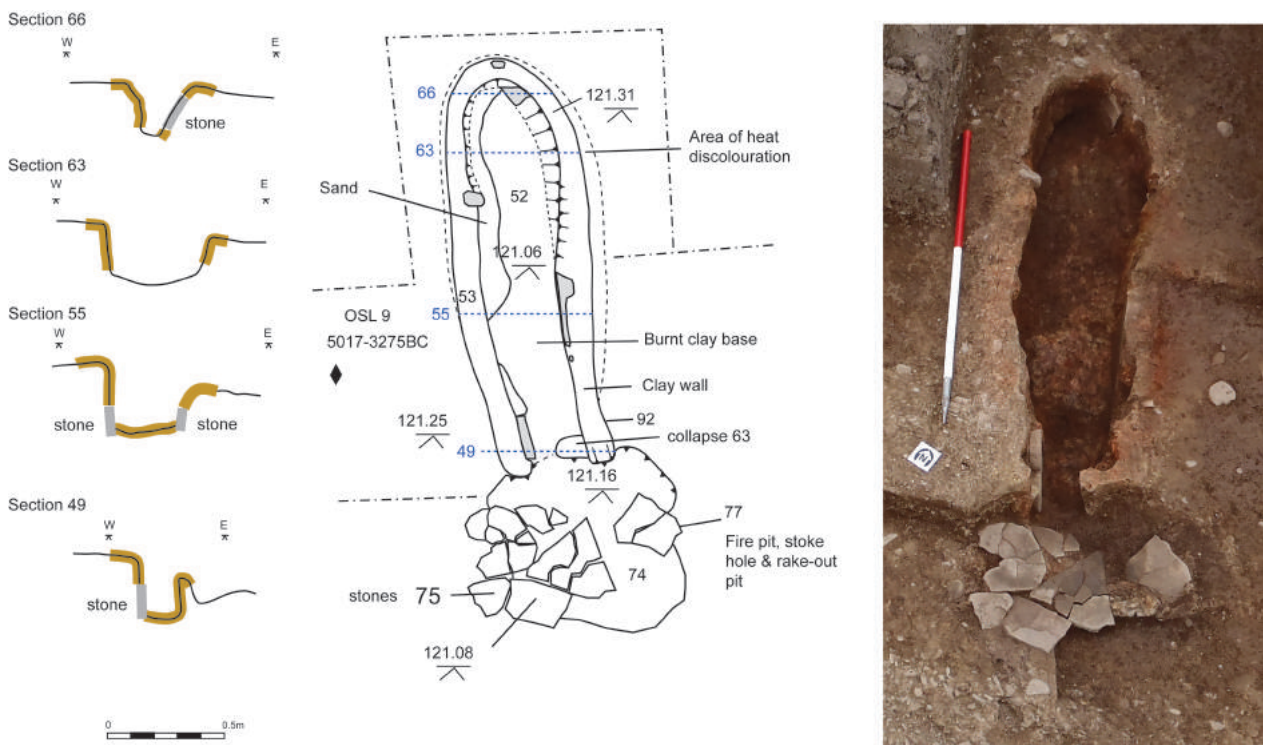
Colour Plate 4b. Phased site plan detail of Area B (with sections through main ditch features superimposed).



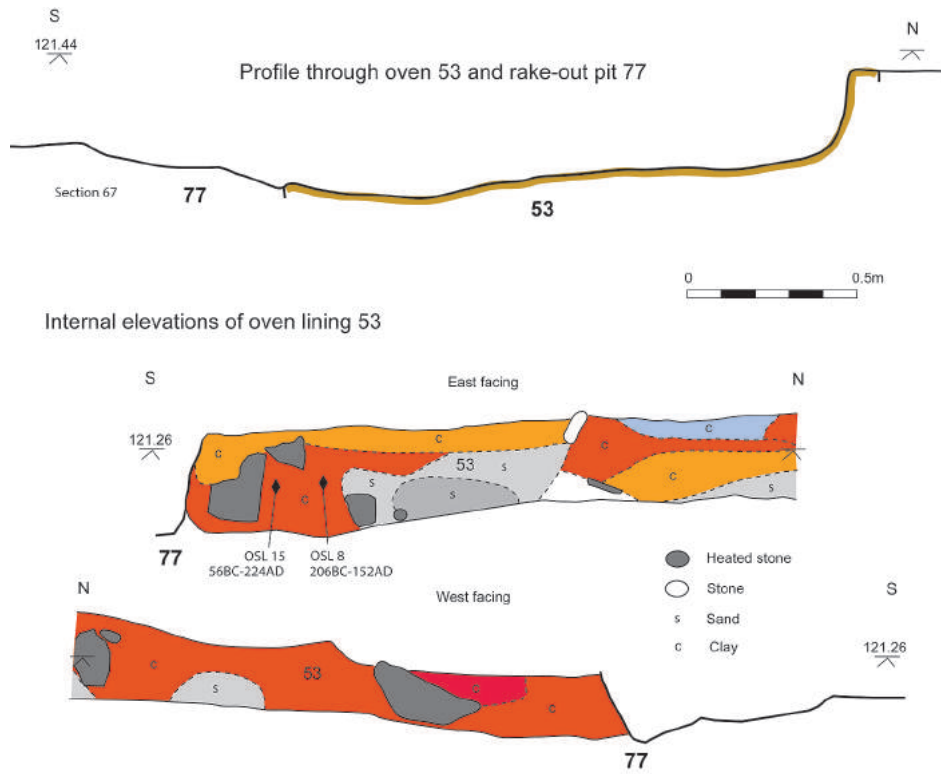
Colour Plate 5. Ditch B phased interpretation of sections from excavated slots across ditch.



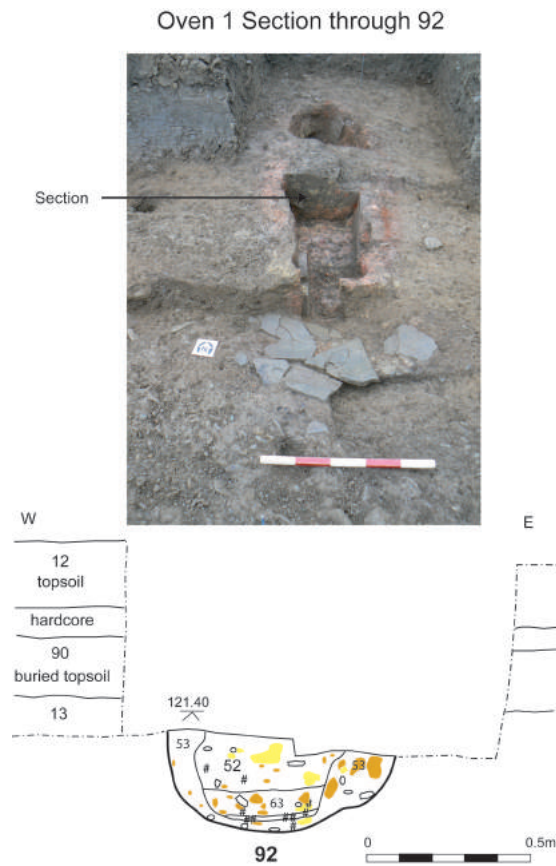
Colour Plate 6. Oven 3 section drawing and photograph.



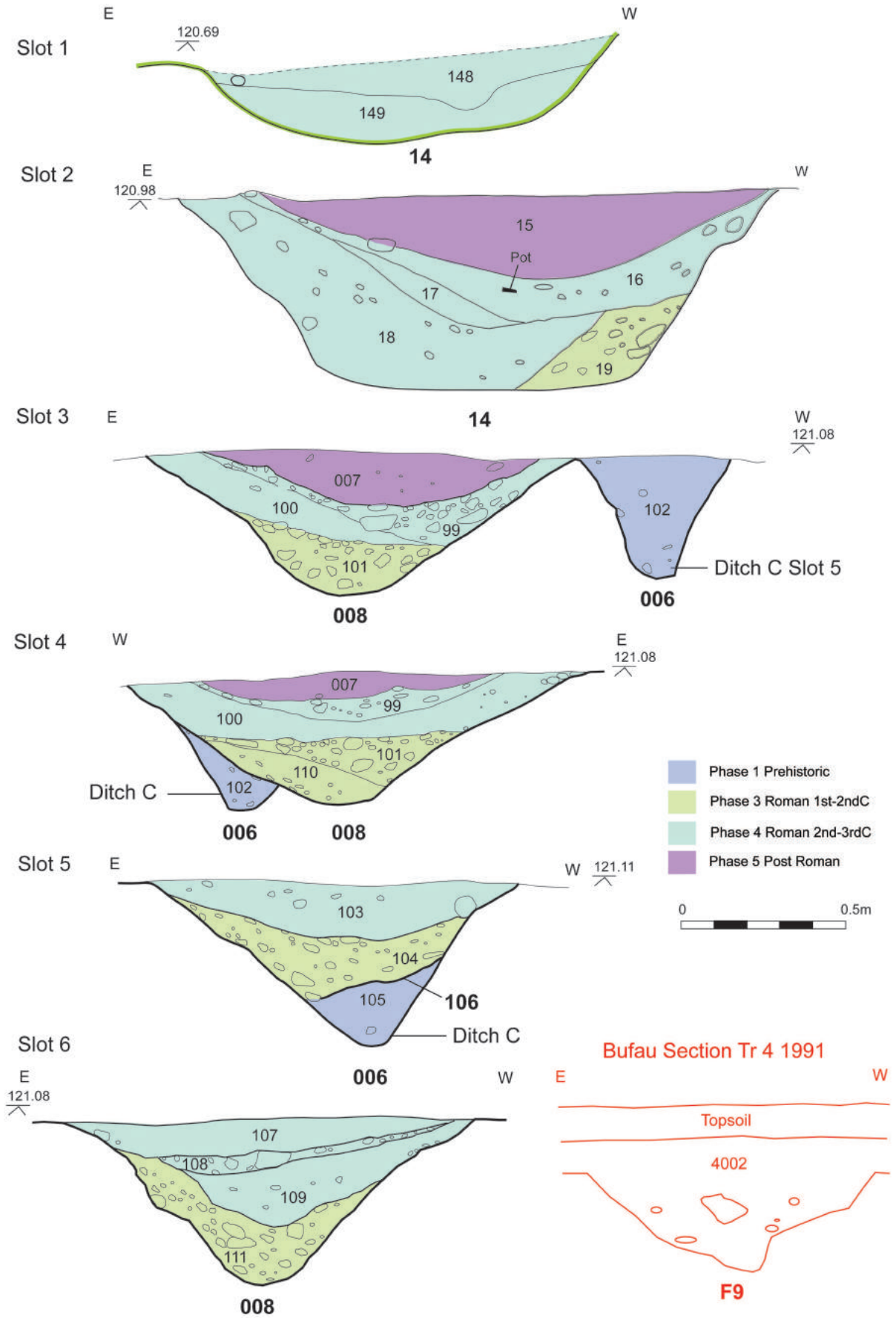
Colour Plate 7. Oven 1 plan, representative profiles through oven, and photograph of excavated feature.



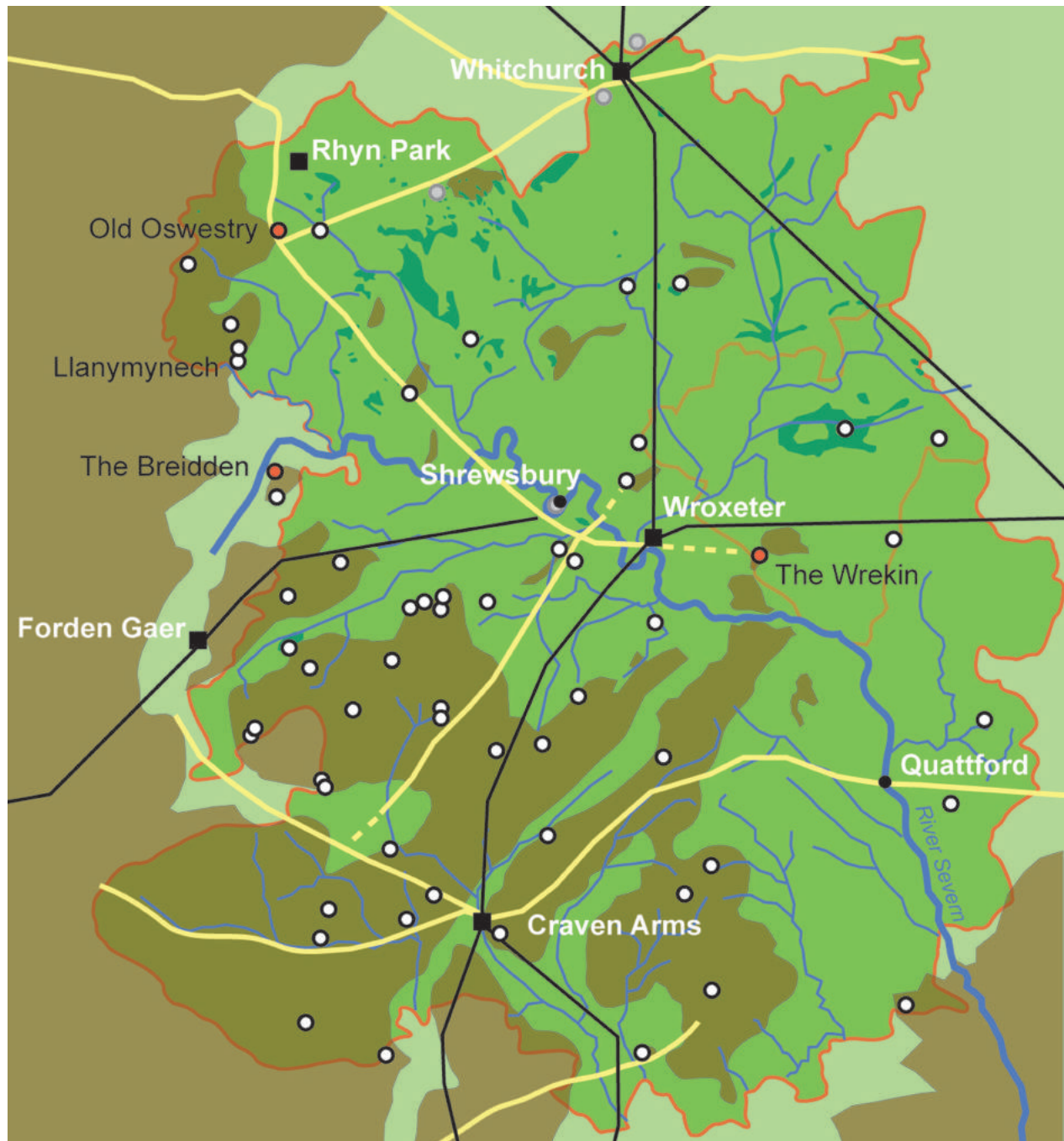
Colour Plate 8. Oven 1 elevations of internal walls showing varying colour of baked clay from different intensities of heat.



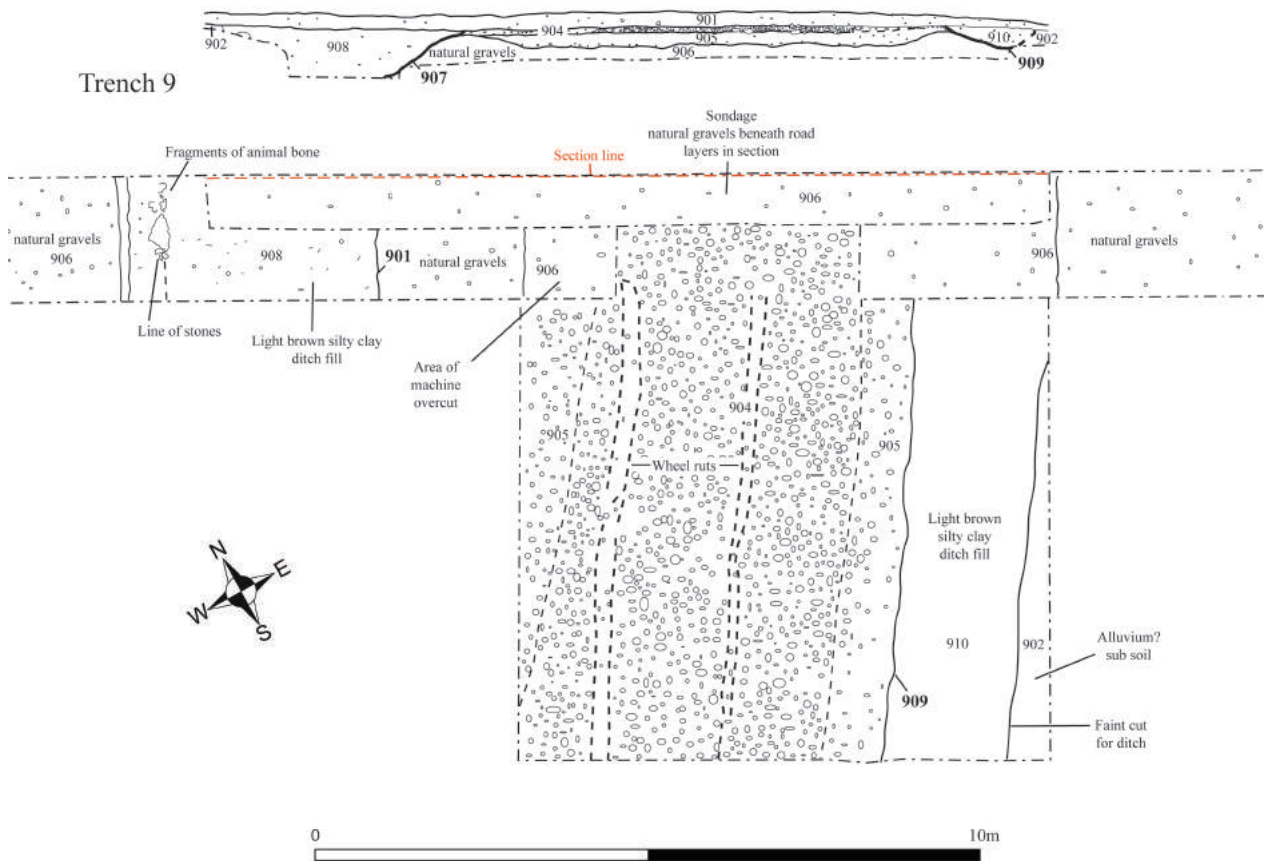
Colour Plate 9. Oven 1 cross section through mid-point of oven and fill, with related photograph.



Colour Plate 10. Ditch D phased interpretation of sections from excavated slots across ditch.



Colour Plate 11. Terrain map of Shropshire showing hillforts (white dots, major sites in red, mauve possible hillforts, names in black), Roman roads (Margary's in black, yellow for additional roads), major Roman military sites (black squares), location names in white. *Created by Caroline Malim.*



Colour Plate 12. Overton Road, Ludlow, excavated road plan, section, and photograph looking north.