For: John Moore Heritage Services
Site: Stanton Harcourt, Oxon
Site code: SHMR 18
Status: assessment / spot date
Author: Jane Timby
Date: November 2018

POTTERY ASSESSMENT

1 Introduction

1.1 The archaeological evaluation and excavation resulted in the recovery of 93 sherds of pottery weighing *c* 1.57 kg. In addition there is one small piece of post-medieval ceramic building material.

1.2 Most of the assemblage dates to the later Iron Age and/ or early Roman period accompanied by a single medieval sherd.

1.3 The evaluation produced pottery from trenches 14, 16 and 18 amounting to some 44 sherds whilst the remaining 49 sherds came from 11 defined contexts revealed during excavation. The assemblage is in moderately good condition in terms of sherds size with large pieces, several joining from the same vessels. This is reflected in overall average sherd weight of 16.9 g. Surface preservation was less good in that the surfaces and sherd breaks were stained or patinated disguising surface finish in many cases.

1.4 For the purposes of the assessment the assemblage was scanned to determine the form and fabrics and the likely date of the pieces. The fabrics were coded using letters to denote the main inclusions following recommendations outlined in PCRG 1997 (see Appendix 1). These were quantified by sherd count and weight for each context. Rims were additionally coded to general form and measured for the diameter and the percentage present (estimated vessel equivalence) (Orton *et al*. 1993). Freshly broken sherds were counted as single pieces. The resulting data was entered onto the accompanying MS Excel spread sheet.

2 Later Iron Age- early Roman period

2.1 Wares dating to the later prehistoric period and /or early Roman period account for all the recovered assemblage with two exceptions. Despite being a small group, there is quite a diversity of fabrics present dominated by grog-tempered vessels.

2.2 The presence of a fine sandy burnt whiteware, possibly an imported piece, and some wheel-made early Oxfordshire grey sandy wares and handmade grey grog-tempered wares suggest that at least some of the contexts date

to the early Roman period. As these occur alongside some of the handmade wares more typical of the later Iron Age it is difficult to determine with such a small group whether it is all dates to the second half of the 1st century or whether it spans the pre and post-conquest period. Several sherds of handmade Savernake-type ware came from Tr 16 (7) are probably early post-conquest in date. Groups containing just handmade pre-Roman wares are provisionally dated as Late Iron Age (LIA) on the Excel spread sheet.

2.3 In terms of forms most of the rims come from necked jars or bowls. There is a single beaded rim jar from Tr 16 (7) and a grog-tempered pedestalled base from, cxt (5).

3 Later wares

3.1 A single very small sherd of medieval date was recovered from cxt (50). The fabric is sandy ware with sparse flint. One small fragment of post-medieval roofing tile was recovered from cxt (11).

4 Potential and further work

4.1 The later Iron Age material recovered from this recent work at Stanton Harcourt is very typical of that previously documented from the immediate area by Grimes (1943) and Green *et al.* (2004) from Gravelly Guy although over the years the general location has also produced considerable quantities of earlier and middle Iron Age pottery along with earlier prehistoric material (Hamlin 1964).

4.2 In general terms the assemblage does not add any new information to the much larger assemblage already published from Gravelly Guy (Green *et al.* 2004). If further work is to be undertaken the assemblage could be briefly described and approximately six pieces illustrated to characterise the group.

4.3 In terms of archive it is recommended that the complete LIA-ERO assemblage is retained.

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Appendix 1: Fabric codes

Fabric	**Description**
BWSY	black medium-coarse sandy; hm
CA	fine, sparse calcareous inclusions
GR	grog-tempered
GRLI	grog-tempered with sparse, fine limestone
GRSA	grog-tempered with sparse rounded quartz sand >0.5 mm
GYFSY	fine grey sandy
GYGR	grey grog-tempered
GYSY1	grey sandy ware- darker surfaces; wm
GYSY2	grey granular sandy
LI1	coarse worn, rounded limestone - lumpy texture
LI2	oolitic limestone
MEDSAFL	medieval sandy with sparse flint
NOGWH?	North Gaulish or local fine whiteware
PMCBM	post-medieval ceramic building material
SALI	sandy with sparse limestone
SAVGT-TYPE	Savernake type grey grog-tempered ware

Stanton Harcourt Airfield, Stanton Harcourt, Oxfordshire

SHMR 18

The prehistoric pottery by Dr David Mullin

Context 3064 <33>, SK15

A total of 472 sherds (4271g) of Middle Bronze Age pottery were recovered from this context. Two sherds were recorded from S4a but were missing from the box supplied to the specialist. An additional 11g of crumbs were recovered from the dry sieve residue of **Context 3055** <29>.

The sherds represent part of a large, relatively straight walled vessel, but it is not possible to estimate diameter or height from the sherds present. The walls are relatively thick, measuring up to 10mm. Fragments of rim and base are present, but less than half of the vessel is represented.

The fabric frequent crushed flint (up to 5mm) and sparse crushed shell. The vessel has a corky texture and contains some voids. The external surfaces are oxidised with patchy reduction to the interior and core. It has been poorly fired, with the outer surface laminating in several areas.

The rim is gently rounded and very slightly everted. No refitting pieces could be identified. Three decorated body sherds were present. Two of these refitted and all had an applied cordon with overlapping fingertip impressions.

The vessel represented here is fairly typical of Middle Bronze Age Deverel Rimbury Bucket Urns.

Context 3057 <30> (Urn 6, SK14)

A total of 40 sherds weighing 244g were recovered from this context. These were in a different fabric to <33>, but did contain occasional voids. Very occasional rock fragments and rare grog were also present in the fabric. Again, the sherds seem to be from a large vessel, but very little of it is represented and it is impossible to estimate size and diameter. No rim or base fragments were present but this vessel probably represents a Middle Bronze Age Deverel Rimbury urn.

Fabric FS1: 472 sherds, 4282g, Middle Bronze Age Bucket Urn.

Fabric RG1: 40 sherds, 244g, probable Middle Bronze Age urn.

Discussion

Contemporary material has been reported from Ring Ditch 4 to the west of the airfield at Stanton Harcourt (Hamlin 1963) and comprises six sherds from a “possible Bucket Urn” from Cremation 4 and a miniature vessel from Cremation 6.

At the Devil’s Quoits, fragments of a Bucket Urn were recovered from the ditch of the henge, but this vessel was decorated with fingernail impressions rather than an applied cordon. The fabric appears to have been similar to that of the examples discussed here, however. Similarly decorated Bucket Urns have been recovered from Circle 1, Standlake Downs (Riley 1946/7) and, although Case

et al (1964/5) describe a vessel from Hanborough Site 3 as a Bucket Urn, the drawing is clearly of a Globular Urn. The illustrations do, however, show large sherds of Bucket Urn with applied cordons and fingertip impressions very similar to those on the vessels from Stanton Harcourt Airfield. These are described as having been recovered from a cremation cemetery at Long Wittenham and were published by E.T Leeds in 1929. They comprise a large Bucket Urn with an applied cordon with fingertip impressions and a fingertip impressed rim; a smaller vessel with a less well executed decorated cordon and a similar small vessel with a horizontal band of applied knobs. Sherds of other vessels are reported but not illustrated. The large vessel is a very good parallel for that from Stanton Harcourt Airfield, although the latter does not have a decorated rim.

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For:	John Moore Heritage Services
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PREHISTORIC AND ROMAN POTTERY

By Jane Timby

Introduction and methodology

The archaeological work resulted in the recovery of some 1175 sherds of pottery weighing *c* 13 kg. The group largely comprised wares of early prehistoric date along with material spanning the later Iron Age-early Roman period. The assemblage was analysed broadly following recommendations outlined in the recently published guidelines (Barclay *et al*. 2016). Sherds were sorted into fabrics based on the colour, texture and nature of the inclusions present in the clay. Known named or traded Roman wares were coded using the National Roman fabric reference system (NRFRC) (Tomber and Dore 1998). Other wares, generally of local origin, were coded more generically following a similar nomenclature according to colour and main fabric characteristics. Fabric descriptions have been kept minimal and are based on the guidelines proposed by Peacock (1977, 29ff). The frequency of inclusions are based on density charts devised by Terry and Chilingar (1955): rare (1-3%); sparse (3-10%); moderate (10-20%); common (20-30%); abundant (30-40%). For earlier generally handmade material the prefixes used follow those recommended by the PCRG (1997) guidelines where the first two letters denote the main fabric constituent. Details of the defined fabrics and associated forms can be found in Appendix 1.

The sorted assemblage was quantified by sherd count and weight for each recorded context. Freshly broken sherds where identified were counted as single pieces. Rims were additionally coded to general form and measured for the estimation of vessel equivalents (eve) (Orton *et al*. 1993). Any evidence of use, such as sooting, burning, or calcareous deposits was noted along with any modifications. The data was entered onto an MS Excel spread sheet from which a spot dated summary by context was extracted (archive).

In general terms the assemblage was in mixed condition with a high frequency of small fragmented sherds but also a few instances of multiple sherds from single vessels giving an overall average sherd weight of 11.1 g typical of refuse material from negative features. Surface finishes and decoration were generally not very well preserved. Some 11% of the total pottery recorded consisted of small rounded crumbs from sieved samples. In most cases these are too small to identify or even verify as pot and not fired clay and are coded OO.

Pottery was recovered from a total 97 cut features, mainly ditches, pits and burials. The distribution however, is quite uneven with some 69% of the features yielding five or less sherds and 20% of the assemblage by sherd count coming from just two pits: 6011 and 2076. This along with a generally very poor typological range in terms of forms and the difficulty in

closely dating wares at this period has some ramifications in terms of working out a close chronology for many of the groups.

In the following report the general composition of the assemblage is described broadly chronologically followed by discussion of the assemblage in relation to the site.

Early Prehistoric

Some 161 sherds weighing 319 g have been identified as of earlier prehistoric date. The assemblage is extremely small and fragmentary with an average sherd size of less than 2 g and many pieces lacking a surface. As far as can be determined these belong to two phases of use dating to the later Neolithic and Bronze Age but several sherds are impossible to place.

There are essentially three fabrics: a fossil-shell-tempered ware (EPSH1) and a limestone and shell-tempered ware (EPSH2) provisionally belonging to the later Neolithic assemblage and which equate with fabrics defined for material from Gravelly Guy (Cleal 2004, 67, fabrics Sh:1-2) who notes further occurrences at Barrow Hills, Radley and Cassington. A third fabric EPSH3 featured as a single abraded piece of Peterborough Ware decorated with whipped cord 'maggot' decoration characteristic of the Mortlake style (Fig. 00.1). This sherd is in fine textured clay, oxidised on the exterior and with a black interior and contains rare fragments of fossil shell. It is probably the same as fabric V:12 defined for material from the adjacent site at Gravelly Guy (Cleal 2004, 65).

Some 129 sherds, weighing 192 g, in a friable black ware with sparse fossil shell (EPSH1) can be identified as belonging to Grooved Ware vessels. Where decorated most sherds are decorated with horizontal lines although one sherd shows a more complex curvi-linear style. None of the pieces are large enough to determine if any have panel designs. There are probably a minimum of two vessels present with an incised groove on the interior face just below the rim and a raised relief band with slashed decoration on the exterior (Fig. 00.2). In some cases it can be seen that the decoration of horizontal grooves continues to the base of the vessel (Fig. 00. 3). One bodysherd from pit recut 6202 has a false relief curvi-linear decorative pattern comprising swirling loops (Fig. 00.4) which could be part of a wider spiral design. Traces of a white substance inside some of the loops, which does not extend onto the breaks, may suggest the design was originally infilled. These sherds would fit well with the Woodlands sub-style.

Fabric EPSH2 is less easy to place with just 9 unfeatured bodysherds weighing 45 g but as these occur alongside fabric EPSH1 and have been defined from Gravelly Guy it is presumed that they represent further examples of Grooved Ware. The Grooved ware assemblage was associated with pits 6011, 6066 and 6109 and the recut of 6020 with a residual sherd in later ditch 6041. The largest group came from pit recut 6202 with 15 sherds which includes the curvi-linear decorated sherd (Fig. 0.3) and other decorated pieces (Fig. 00.1) along with the Peterborough sherd. Grooved ware is now well-known from several sites in the Upper Thames Valley and adjacent regions and pits containing this ware have already been documented at Stanton Harcourt (Thomas 1955; Case 1986; Cleal 2004; Barclay 1999). Previously the Woodlands sub-style was thought to be late in the chronological sequence and overlap with

Beaker but it now appears it could be earlier *c* 2900 BC and before the emergence of the Durrington Walls sub-style (2700/2600 BC) (A. Barclay pers. comm).

?Bronze Age

Cremation 3054 (3056) comprised 12 very friable fragments weighing 59 g belong to a small ?biconical urn with vertical sides and possibly a raised cordon. The wall thickness is 10 mm. The fabric is a very friable pale orange to grey ware with frequent voids from dissolved calcareous inclusions and appears to be unique to this vessel in this assemblage.

Pottery recovered from cremation 3062 comprised two very small sherds of coarse, ill-sorted flint tempered ware (6 g) and three small plain bodysherds of shelly ware. The flint-tempered sherd shows a sharp carination with a band of diagonal line decoration above the carination which could possibly be from a collared vessel. The date of this group other than prehistoric is uncertain.

Later prehistoric-early Roman (Table 1)

Most of the assemblage, some 746 sherds weighing 12.6 kg and with 9.93 EVE's, dates to the later Iron Age-early Roman period. This excludes unidentified small crumbs recovered from sieving. Discriminating material dating to the latest Iron Age as opposed to the early Roman period is difficult to define due to the persistence of the grog-tempered tradition well into the Roman period. Overall the assemblage is a very conservative one dominated by local wares and with a very limited typological range. The group can be split into two: wares that could potentially date back to the later Iron Age and wares which are more clearly Roman.

The former group is dominated by grog-tempered sherds in both handmade and wheel-made vessels. Six grog-tempered wares are defined largely based on firing colour (BWGR, BSOXGR, GR, GYGR and OXGR) or in the case of fabric GRSJ large storage jars. A further five fabrics have sparse additional inclusions accompanying the grog which include flint (GRFL); sand (GRSA); organic matter (GROR); charcoal (GRCH) and limestone/shell (GRLI). Collectively this group accounts for 34.3% by sherd count of the assemblage. The grey, soapy grog-tempered wares appear to fall between the later sandier Roman fabric Oxford R38 and Savernake ware which is consistently harder and occasionally contains sparse flint. The concentration of fabric R38 in West Oxfordshire has led Booth (2018, 300) to suggest a source in this general area. The relationship between these developed grog-tempered/clay pellet industries featuring in Oxfordshire and Wiltshire is currently unknown, if indeed there is one, and it may simply reflect a tradition rather than a single source(s). The inception of the Savernake industry is also poorly understood at present.

The range of forms is limited to jars, mainly necked or cordon-necked types with flared, simple everted or expanded rims. There is a single pedestalled foot (Fig. 00. 5) from pit 4 and around 25% of a spindle-whorl from ditch terminal 2500.

Also belonging to this group are a small number of grey, oxidised or black fired wares containing sparse limestone (GYLI, OXLI, BWCA), a flint-tempered everted rim jar and three indeterminate soapy organic tempered sherds. The latter pieces are small and appear to

come from early Roman pits (1019, 1038, 1139) and could either be prehistoric or Saxon although there is no other ceramic evidence for the latter presence.

The Roman assemblage proper spans the early 1st century through to the mid-2nd century with just one recognisable sherd of late Roman pottery. The assemblage includes a very small number of continental and regional imports but mainly comprises 'local' coarsewares.

Continental imports are limited to three sherds of Central Gaulish samian (LEZ SA 2) with examples of a small dish Dragendorff 40 and a cup Dragendorff 33 all from ditch group G1520. There are no imported mortaria or amphorae present. Regional imports are restricted to Dorset and South-west black burnished ware and Savernake ware. The Dorset wares (DOR BB1) are limited to three 2nd-century jars with decorated with acute burnished line lattices whilst the South-west wares (SOW BB1) feature a flat-rimmed bowl decorated with a double line chevron design. The Savernake ware (SAV GT) comprises bodysherds and one rim from handmade storage jars, two decorated with incised wavy line or chevrons incised on the shoulder.

Oxfordshire products are exceptionally common which is not surprising in view of the site location. In the earlier Roman period these are less standardised and mainly comprise grog-tempered storage jar, Abingdon region oxidised ware (Timby *et al*. 1997); oxidised, grey (OXF RE; OXFFR) and black sandy wares; a grey sandy ware with grog (Oxford fabric R38) (Booth 2018, 300); a white-slipped ware; a black surfaced white ware; white wares (OXF WH) and shelly ware.

The grey wares dominate the group accounting for at least 17.4% count of the assemblage followed by Oxford fabric R38 at 9.7%. Forms are limited to bowls and dishes (Young 1977, types R43 and R52); a tankard with lattice decoration; beakers including one poppyhead type with barbotine dot decoration (ibid. type R34) and several everted rim jars. The grogged fabric version, Oxford fabric R38 largely features as necked jars with expanded rims one of which, from ditch 6005, is sooted in the interior and at least one flat-rim bowl. The oxidised Oxfordshire wares include a base with an incompletely impressed pattern stamp from pit 2076 and a sherd decorated with white painted circles, lines and dots from pit 1139. There is a single basesherd in later Roman Oxfordshire red-slip ware (OXF RS) from ring-ditch 3075. Oxfordshire shelly wares make up 5.4% count of the assemblage and sherds almost exclusively come from jars.

A variety of other sandy wares are present largely in small quantities most of which are presumed to be fairly local products and have been treated as generic groups. These include fine black ware and oxidised, grey wares and white-slipped oxidised wares. None are present in significant quantities and there are few featured sherds.

In terms of forms the Late Iron Age-Roman pottery totalled 9.93 EVE's. Jars totally dominate the group collectively accounting for 75%. The remaining 25% are split between beakers (4.7%); tankard (5%), bowls/dishes (14.3%) and flagon (1%).

Chronology and site distribution

As noted above in the introduction the distribution of material is very uneven and there are a large number of very small assemblages which often contain no closely diagnostic material. The basis of dating has been largely on the presence of certain fabrics which effectively provide a *terminus post quem* in that the group cannot date before that date but could date any time after. For the later Iron Age- early Roman period this is based on a small group of sherds in grog-tempered and related fabrics and an absence of wheel-made grey wares which signal an early Roman date.

The sequence of ditches, enclosures and pits in Area 1 yielded a total 273 sherds weighing 3550.5 g. Potentially the earliest feature is ditch group G1504 with a single grog-tempered jar rim. Pit 1147 with 10 sherds may also be among the earlier features. Enclosure ditches G1500, 1502 and 1503 all contain pottery dating to the early Roman period and of these 1503 may be the earliest with a higher incidence of grog and handmade sherds but including single sherds of Oxon grey ware, Savernake ware and black-surfaced white ware whereas G1502 has slightly more grey ware including fabric R38. Ditch G1500 only produced five sherds but all early Roman types and no grog-tempered ware. At least four pits similarly contain early Roman pottery (1023, 1038, 1153 and 1156).The latest enclosure with material dating to the 2nd century is G1501 with a total 101 sherds including Lezoux samian and Dorset and pottery. Similarly later in the sequence are pits 1019 and 1139.

An assemblage of 251 sherds weighing 4390 g came from Area 2 of which 118 sherds came from sections across enclosure G2500. This latter group comprises a mixture of later Iron Age types and more Romanised wares including sherds of Abingdon–style butt beaker, Savernake ware and Oxon grey wares with a possible poppyhead beaker. The enclosure had probably gone out of use or silted up by the end of the 1st century. Some later contamination is present in the form of a piece of modern ceramic building material and a post-medieval sherd. There are also 18 fragments of fired clay present of indeterminate nature. A large group of 120 sherds came from pit 2076 which includes a number of early Oxon products including grey ware, oxidised ware and white ware suggesting this may be later and date to the 2nd century. The stamped OXF OX base came from this feature.

Ring ditch 3500 in Area 3 produced some 99 sherds of pottery weighing 826 g with a *terminus post quem* also in the 2nd century based on two sherds of BB1. One sherd of late Roman Oxfordshire colour-coated ware form (3075) is presumed to be intrusive. Oxon grey wares account for around 22% count and grog-tempered wares from around 45% count.

The various graves produced a total 166 sherds weighing just 309 g. Of this some 121 sherds weighing 119 g date to the earlier prehistoric period and came from just three cuts: 3054, 3062 and 3062. Disturbed Grave 3054 contained 28 sherds from the possible small biconical cremation urn, 16 fragments of which are just crumbs and five fragments of intrusive modern CBM. Cremation 3062 produced 28 small sherds of shell and limestone-tempered ware, two flint-tempered sherds, one decorated and 75 small crumbs of indeterminate early prehistoric date.

The remaining 45 sherds were distributed across nine graves and comprise small sherds probably incidentally included in the grave fills. Of these graves 3040, 3042 and 3070 could potentially by later Iron Age or early Roman whilst graves 3000, 3047, 3049, 3066, 3153 and **** (3154) appear to be early Roman. Of note is Grave 3047 with 14 sherds of which five are Oxon grey wares, the remainder potentially LIA wares. Grave 3066 produced a tiny sherd of Abingdon butt beaker which could suggest a pre-Flavian date and similarly Grave 3049 also had a small sherd of beaker but in Oxon fine grey ware.

The watching brief carried out in Area 1 produced just two Roman sherds one of which, from ditch 4002, is a sherd of 2nd-century SOW BB1 flat-rimmed bowl. No pottery was recovered from watching brief Area 2.

Watching brief Area 3 produced some 271 sherds weighing 2342.25 g of which 159 (253.25 g) are of earlier prehistoric date. The latter sherds, mainly sherds of Grooved ware all came from pits 6011 and 6109 and pit recuts 6020 and 6202. There is one possible intrusive later sherd in 6020.

The remaining features with pottery all date to the later Iron Age or early Roman period. Ditch group 6500 produced 37 sherds including several pieces of Oxford fabric R38 and grog-tempered wares, Savernake ware but no Oxon sandy wares suggesting potentially a pre-Flavian date. Ditch G6501 produced just two sherds of black sandy ware of later Iron Age or Roman date whilst G6503 produced nine sherds seven of which came from a single grog and sandy ware burnished ware jar of similar chronology so is potentially contemporary and earlier than G6501 although the quantity of pottery is rather too small to give close dating. Ditch F6504 produced 12 sherds from cut 6043 with one residual earlier prehistoric sherd, various grog-tempered wares and a single sherd of Oxon grey ware pushing it into the early Roman period. At least six pits also belong to the early Roman period although five of these had three or less sherds. Pit 6066 had 14 sherds of Savernake ware and one residual early prehistoric sherd..

Conclusion

The pottery assemblage recovered from the recent phase of work at Stanton Harcourt is quite modest in size and composed essentially of three components later Neolithic, probably Bronze Age and later Iron Age-early Roman. In broad terms the earlier prehistoric pottery accounts for 23.8% by count but only 2.5% weight of the total group.

The area has seen a very long history of use and pottery of similar date has previously been found in the general locality, most particularly Gravelly Guy to the immediate west (Lambrick and Allen 2004) which yielded a considerably larger assemblage spanning the Neolithic through to the Saxon period. Unlike Gravelly Guy there is no evidence of an early or middle Iron Age presence in this group of material from Stanton Harcourt which appears to show a briefer phase of settlement developing from the later Iron Age-early Roman period.

Like Gravelly Guy the later Iron Age-early Roman assemblage from Stanton Harcourt has a very rural character with generally very low levels of continental and regional imports, a high

incidence of local coarsewares and a limited repertoire of vessels overwhelmingly dominated by jars. Samian accounts for well under 1% also reflecting the rural economic character of the settlement. If the dated contexts are divided chronologically into later Iron Age-early Roman, early Roman (1st century AD) and Roman 2nd century, the LIA-early Roman accounts for 14% by sherd count, the early Roman for 46.6% and 2nd century for 19.5% of the wares. This shows a peak of activity in the mid-later 1st century, which is showing a decline into the 2nd century. With the exception of one sherd, most of the assemblage suggests the site fell out of use in the mid-later 2nd century.

Catalogue of illustrated sherds

1. Worn bodysherd of Peterborough Ware decorated with whipped cord 'maggot' impressions. Oxidised exterior, black interior. Fabric: EPSH3. Pit recut 6202 (6110).
2. Rim fragment with a relief band decorated with grooves on the exterior and a groove and raised rim on the interior. Fabric: EPSH1. Pit 6111 (6110).
3. Base sherd with two surviving, slightly irregular grooves. Brown exterior, black interior. Fabric: EPSH1. Pit 6109 (6191).
4. Bodysherd with curvi-linear decoration in the form of swirling loops possibly part of a spiral. Traces of a white substance in some areas may suggest the negative areas were originally infilled. Angle and orientation uncertain. Fabric: EPSH1. Recut pit 6202 (6124).
5. Pedestal base. Fabric: GR. Pit 4 (5).
6. Wide-mouthed, cordon necked bowl. Handmade, wheel finished with a burnished exterior. Fabric: GR. Ditch 35 (37).

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SHMR 18 - Stanton Harcourt, Main Road, Land at Former Stanton Harcourt Airfield

1. Faunal Remains

Marine Shell

A single marine shell, weighing 7.4g, was collected from context (18/05). The item was positively identified as a valve of *unio*, a type freshwater mussel.
It is not recommended to retain the mussel shell due to its very limited potential for further analysis.

Animal Bone

85 fragments of animal bone, of a combined weight of 953.4g, were hand-recovered from 13 different features.
The state of preservation of the material varied from fair to mediocre; particularly, the items recovered from context (18/05) were found to be extremely fragmented. Severe fragmentation was observed across the entire assemblage; the only complete items being the cow phalanx found in deposit (05) and the sheep/goat phalanx from deposit (37). Conjoining fragments, originated by breakage occurred after the collection of the material, were recorded for only 3 of the items.

Feature	Context	Identification	Type	No. of Items	Weight (g)	Marks	Comments
Ditch 14/21	14/18	Pig	Mandible with P3-P4, M1	1	20		
		Small Mammal	Rib	1	5.4		
			Cortex	1	0.9		
Ditch 16/06	16/07	Cow	Molar	1	23.4		
		?Cow	Distal femur epiphysis	1	33.7		
		?Sheep/Goat	Mandibular hinge	1	17.9		
		Small Mammal	Mandible	1	11.3		
			Long bone cortex	1	6		
		Mammal	Cortex	1	6.3		
			?Femur	1	27.8		
Ditch 16/10	16/13	Sheep/Goat	Proximal tibia	1	13.9		
		Large Mammal	Tibia diaphysis	1	55.7	?Chop	
			?Rib cortex	1	16.8	Chop	
		Small Mammal	Scapula	1	13.1		
			Long bone cortex	1	10		
Ditch 18/04	18/05	Mammal	Cancellous bone	14	20.1		Poorly preserved
Ditch 19/04	19/05	Mammal	Cortex	2	7.9		
			Undetermined	1	9.6		
Pit 04	05	Sheep/Goat	Cranium with horn core	1	51.8		
			Mandible with P1-P3, M1-M3				
			Premolar	1	6.4		
			Pelvis	1	28.6		
		Pig	Maxilla with M1-M2	1	23		
		Cow	First phalanx	1	11		Complete
		Small Mammal	Cortex	1	3.7		
		Mammal	Undetermined	1	3.3		

Ditch 13	14	Sheep/Goat	Metacarpus	2	55.4		Conjoining. Unfused
		Cow	Distal metacarpus/metatarsus	1	25.8		
		Small Mammal	?Ulna	1	17.9		
	15	Cow	Proximal metatarsus	2	79.8		Conjoining
			Distal metacarpus/metatarsus	2	60.3		
		Large Mammal	Long bone diaphysis	2	27.7		Conjoining
			?Rib	1	11.6		
Ditch 16	17	Large Mammal	Long bone cortex	1	24.4		
Ditch 23	24	?Deer	Metatarsus	1	7.7		
Ditch 35	37	?Sheep/Goat	Second phalanx	1	0.7		Complete. Partially burnt
		Small Mammal	Cortex	1	1.1		
			?Cranium	5	37.7		
			?Pelvis	12	78		
		Mammal	Undetermined	8	5		
Pi 40	43	Small Mammal	Calcaneous	1	30.4	?Chop	
		Mammal	Undetermined	1	7.5		
	44	Small Mammal	Long bone cortex	1	2.2		
Ditch 45	46	Small Mammal	?Pelvis	1	23.4		
Gully 61	62	Small Mammal	?Mandible cortex	1	1		?Mental foramen

Table X: Animal bone occurrence by feature, context and type

Only 20 of the remains, representing over 23% of the assemblage, were identified on the basis of the observation of *Genus*-specific characteristics; of the remaining items, 30 were attributed to 'small mammal' (usually comprising sheep/goat, pig, roe deer) and 6 to 'large mammal' (cattle and horse) of undetermined species (O'Connor 2003), exclusively on the basis of the size range of the fragments; these represented 35% and 7% of the collection, respectively.
Due to the variable sizes and robustness of animal bones taphonomic factors favour preservation of certain species, resulting in the under-representation of other, smaller animals (Kasumally 2002).

Among the identified *taxa*, sheep/goat was the most represented, with 9 items; 8 of the fragments were identified as cow, while pig was represented by 2 examples. A single item was tentatively assigned to deer.

Overall, small mammals, including identified taxa as well as undetermined species, represented 49.4% of the assemblage; only 16% belonged to large mammals, comprising cow and unidentified examples. The remaining 35% of the material was too fragmented to be assigned to either of the size-based groups.

Possible butchering evidence, restricted to chop marks, was recorded only on 3 of the bone fragments; however, the fragmentary state of the material might have led to an underrepresentation of the butchering activities.

2. Fired Clay

A small quantity of burnt material was recovered from deposit (42). The material, weighing 8.7g in total, was tentatively identified as fired clay.

3. Lithic

A very limited assemblage of 4 flint fragments, of a combined weight of 14.2g, was hand-recovered from three different contexts.

Deposit (62) contained one flint fragment, weighing 2g and measuring 35mm in length. The item was severely scorched, resulting in white discolouration, and was tentatively identified as an incomplete blade.
One additional fragment of possible worked flint, weighing 1.8g and measuring 29mm in length, was found in deposit (16/12). Part of the cortex as well as ripples were observed, although it was not clear if the fractures were caused by percussion or natural processes.

Two fragments of unworked, burnt flint, of a combined weight of 10.4g, was collected from two contexts, deposits (37) and (42).
Exposure to high temperatures gives burnt flint the typically cracked, angular surface, and white/grey discolouration. Although not datable *per se*, burnt flint is commonly found in prehistoric contexts. In this period, waste chips and redundant tools were probably disposed of in camp fires or purposely used to transfer heat to water for cooking.

The unworked, burnt flint fragment is not recommended for retention, due to its extremely low potential for further analysis.

4. Metalwork

A single, severely corroded metal artefact was recovered from deposit (16/07). The object positively identified as an iron nail, weighted 3.5g and was preserved to a maximum length of 35mm. It showed a rectangular cross-section and a flat disc head, and its point was not preserved; the object was tentatively dated to the Post-Medieval period.
The iron nail was not retained due to its poor state of preservation, and low potential for further analysis.

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Stanton Harcourt Airfied
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Milena Grzybowska

5.1 Introduction & Methods

In October 2019 John Moore Heritage Services Ltd. Commissioned Archaeological Research Services Ltd. to conduct a comprehensive macroscopic analysis of unburnt and burnt human remains uncovered in 2018 during archaeological works at Stanton Harcourt Airfield.

The aim of the following osteological analysis was to identify the age and sex of the individuals and any skeletal manifestations of disease and trauma, as well as to inform on occupation, ancestry and familial affinities where possible. The objectives included estimation of bone preservation and completeness of the skeleton through inventory of the skeletal material, sex, age, metric data and stature, as well as observation of pathologies and presence/absence of non-metric traits.

Bone derived from 17 contexts and comprised 14 articulated skeletal remains and four groups of burnt bone. The analysis of skeletal unburnt remains is presented in Section 5.2., which is followed by the investigation of burnt remains in Section 5.3.

Methods
The analysis and reporting were undertaken in accordance with the guidance laid out by the Historic England (Mays et al. 2004) as well as by the British Association of Biological Anthropologists and Osteologists in conjunction with the Chartered Institute for Archaeologists (Brickley and McKinley 2004 and Mitchell and Brickley 2019).

The entire material was analysed macroscopically and, when necessary, with the aid of a magnifying glass (x5). A digital photographic record was compiled for all identified pathologies. The osteological material was analysed without consideration of associated artefacts so that the analysis could be as objective as possible.

The inventory of the articulated remains was recorded in a tabular form as well as graphically. Surface preservation of bone was scored according to a three grade scale: good, moderate and poor, corresponding to grades 0-2, 3, 4-5+, respectively, as described in Brickley and McKinley (2004). Fragmentation of skeleton was scored using five categories: minimal, slight, moderate, heavy and extreme. Stature was estimated using regression equations devised by Trotter (1970). Diaphyseal lengths of unfused bones were taken to investigate symmetricity of the long bones as well as to estimate diaphyseal age of subadult individuals based on Maresh's guides (Maresh 1970 after Scheuer et al. 2008). Skeletal (Finnegan 1978, Berry and Berry 1967) and selected dental non-metric traits were scored as present, absent or unobservable.

All cremated human bone was wet sieved. The unidentified bone was sorted into three fractions of over 10mm, 10-6mm and 5-1mm using UKAS accredited calibrated sieves and weighed to one decimal place. A complete inventory of identified specimens was compiled. The total and group bone weights as well as dehydration indicators and exogenous staining of

the bone were recorded, the level of fragmentation estimated and the maximum bone fragment lengths measured. The level of oxidation was inferred from the colour of the bone. Preservation of the bone was scored using five point scale (excellent, good, moderate, poor and bad). An attempt to obtain demographic data was undertaken. The minimum number of individuals (MNI) was established based on skeletal element identification, side, age and sex estimation results.

Age was estimated on the basis of epiphyseal fusion of bones (Scheuer and Black 2000), morphology of pelvis (Brooks and Suchey 1990, Lovejoy et al. 1985) as well as the development, eruption (AlQahtani 2009) and wear (Brothwel 1981) of teeth. Age was categorised as follows: foetus (up to 40 weeks *in utero*), neonate (around the time of birth), infant (INF, newborn to one year old), juvenile (JUV, 1-12 years old), adolescent (ADO, 13-17 years old), young adult (YA, 18-25 years old), young middle adult (YMA, 26-35 years old), old middle adult (OMA, 36-45 years old) and mature adult (MA, 46+). An additional broader category of adult (17+) was also used where necessary. Sex was establish on the basis of morphology of cranium and pelvis.

5.2 Results: Articulated human remains

A summary of the osteological analysis is presented in Table x.1. Dental inventory is presented in Appendix X whereas the hard copy of skeletal inventory and non-metric traits catalogue along with metrical and pathological data are included in the archive.

5.2.1 Preservation

The surface preservation of the skeletons was good (nine individuals) to moderate (five individuals), whereas post-depositional fragmentation was predominantly slight (eight individuals) and moderate (four individuals) with only two individuals showing heavy fragmentation of bone (Table x.1). Overall good surface preservation and low level of elements fragmentation permitted metrical, normal variation and palaeopathological analyses

5.2.2 Completeness

The completeness of the skeleton was calculated according to the percentage of the bones present in relation to the total number of bones in a human body. This is estimated through an assessment of the amount of material representing different areas of the body. A complete skeleton comprises skull - 20%, torso - 40%, arms - 20% and legs - 20%. Each skeleton was ascribed into one of five categories of completeness: 0-20, 21-40, 41-60, 61-80, 81-100 per cent.

Nine individuals fell into the excellent (81-10%), three to good (61-80%) and the remaining to the moderate (41-60%) completeness category, which indicated no post-depositional human activity within the cemetery.

5.2.3 Demographic data

Estimation of sex was possible for seven skeletally mature individuals and tentatively for three individuals at puberty age. The assemblage included six females and probable females (?F) as well as four males and probable males (?M). All skeletons were ascribed to age category, showing predominance of adults (six individuals) followed by adolescents and

adolescent/adults (five individuals) and young children (three individuals), including an infant (Figure x.1). Male individuals were spread evenly across all sexable age categories (n=1 in ADO, YMA, OMA and MA classes). Females were predominantly classified as late adolescent (n=3) and young middle adults (n=2) with a single individual of possibly mature adult age (SK11).

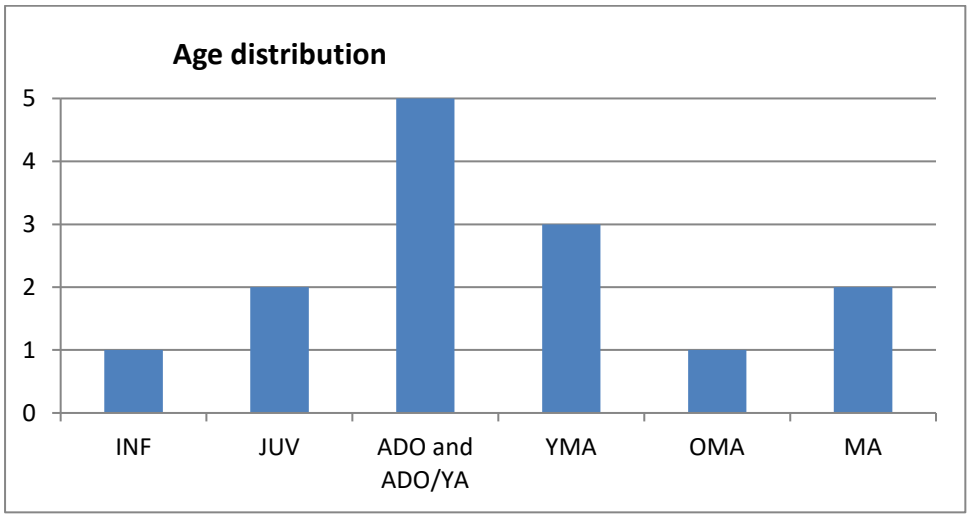

Figure x.1. Age distribution of articulated human remains.

5.2.4 Metric analysis

Good preservation permitted collection of metric data for a proportion of long bones. Stature was estimated for five individuals using Trotter's (Trotter 1970) as well as Owsley's (Owsley 1995 after White 2005) regression equations for femora, fibulae, humeri, radii and ulnae of both sides. Trotter's method produced consistently smaller ranges of heights per individual and these, along the heights based on femoral and humeral lengths, are presented in Table x.1. The average of estimated heights for male/?M was 172.6cm±3.27 or 177.3±4.05 (based on femur and humerus, respectively), whereas female/?F produced corresponding heights of 158.0cm±3.72 or 162.5cm±4.45. The stature results obtained from the Stanton Harcourt skeletons, which averaged at 172cm and 161cm for male and female respectively, was similar to the heights of individuals recovered from other, contempoarenous British sites (Roberts and Cox 2003, 195).

A marked asymmetry of limbs was identified in the three measurable male/?M (Figure x.7e) and an adolescent ?female (SK6) skeletons expressed as consistently higher lengths for left femora and right humeri in comparison to the elements of the opposite side.

The asymmetry of long bones was also manifested as side differences in the shape of bones, expressed as platymeric (PMI) and platycnemic (PCI) indices, calculated for four male/?M and two female/?F individuals (Table x.1). Both females produced average PMI of 69, ranging from 67-73, all within a platymeric range. Femora of male/?M provided PMI equal or higher than 80, ranging from 80-93, predominantly of the eurymeric range and averaging at PMI of 87. Females/?F showed consistently flatter upper femora, which is consistent with a notion (Brothwell 1981) that platymeric femora are typically more commonly reported for females than men. Six measurable individuals consistently produced eurycnemic indices of

tibiae. Overall, metric analysis of the individuals SK4, SK5, SK8, SK9, SK12 and SK13 indicated a homogenic population with marked dimorphic differences in stature and PMI.

5.2.5 Non-metric traits

Normal variation traits are relatively rare osteological features of varying aetiology. Non-metric traits may aid in investigation of hereditary affiliation, while some reflect differences in mechanical stress and environment the individuals are exposed to.

Non-metric traits were regularly observed within the analysed population, although the level of observability for the traits differed between the individuals. The absence of zygomatico-facial foramen and the presence of lambdoid ossicles as well as rhomboid and hypotrochanteric fossae were the most common non-metric trait within the assemblage and present in five individuals. Further frequently identified normal variation, scored for at least three individuals, included the presence of frontal notch or foramen, parietal foramen, pre-auricular sulcus, Poirier's facet as well as the opened posterior condylar canal. Adolescent (SK6) (Figure x.2) and young middle adult (SK13) ?females showed retained metopic sutures which are normally fused by the age of two. Among dental non-metric traits the most frequently observed was shovelling of incisors. Further, individual SK6 presented bilateral pneumatised turbinates (concha bullosa) of nasal bones. In conclusion, the distribution of non-metric traits suggests a homogenous population with only one exception characterised by SK10.

Individual SK10 presented a dissimilar suite of normal variation traits that included a bipartite accessory transverse foramina of cervical vertebrae, an absence of anterior calcaneal facet, the presence of a canine distal accessory ridge and dissimilar root numbers of the mandibular second molar. The uniqueness of these traits within the assemblage may indicate a wider ancestral distance of SK10 from the other remaining individuals.

5.2.6 Pathology

Pathological conditions were categorised according to their aetiologies: joint and neoplastic diseases, ante-mortem trauma and dental pathology. Vertebral pathology was recorded at vertebral joint level. Due to the small sample size, comprising fourteen individuals, the prevalence of skeletal lesions was not calculated. Conversely, prevalence rates of dental pathologies were calculated at the population level.

Dental pathology

The presence, location and severity of all dental pathologies were recorded to an individual tooth level for thirteen individuals including nine sexed individuals. To allow for calculation of true prevalence rates it was noted when a particular pathology was observable. Prevalence rates calculated for enamel hypoplasia, dental plaque and caries were based on the total number of teeth affected expressed as a percentage of the total number of teeth for which the presence or absence of a particular condition could be stated. Periodontal disease (PD) and periapical lesions (PL) were recorded on an individual tooth level using methods advised by Ogden (2008), which focus on the morphology of the alveolar margin (PD) and the size of the void, porosity of its lining and the morphology of the rim (PL). The prevalence was based on the total number of lesions expressed as a percentage of a total number of observable sockets. Prevalence of ante-mortem tooth loss (AMTL) was based on the total number of the

teeth lost before death expressed as a percentage of the total number of tooth sockets and loose teeth present (congenitally absent teeth were excluded). In total up to 305 teeth and 321 tooth position and teeth were observable for pathological changes.

The most frequently identified dental pathologies included calculus, followed by linear enamel hypoplasia (LEH) and periodontal disease (Figure x.3) (Table x.2). Carious and periapical lesions as well as AMTL were present considerably less frequently.

Dental disease	All individuals			Sexed individuals		Female/?F		Male/?M	
	No. of affected individuals	TPR%	Observable teeth/positions	TPR%	Observable teeth/positions	TPR%	No. of affected individuals	TPR%	No. of affected individuals
Calculus	9	51.5	295	71.4	213	64.0	5	79.8	4
LEH	9	15.5	271	16.8	197	23.9	4	7.1	2
Periodontal disease	2	15.3	215	20.0	165	10.7	1	29.6	1
Carious lesions	6	7.5	305	9.9	223	15.3	3	3.8	2
Periapical lesions	3	2.9	276	3.7	214	3.8	2	3.7	1
AMTL	1	2.5	321	3.5	230	0.0	0	6.7	1

Table x.2. Prevalence rates of dental diseases for all and sexed individual (individual and teeth affected).

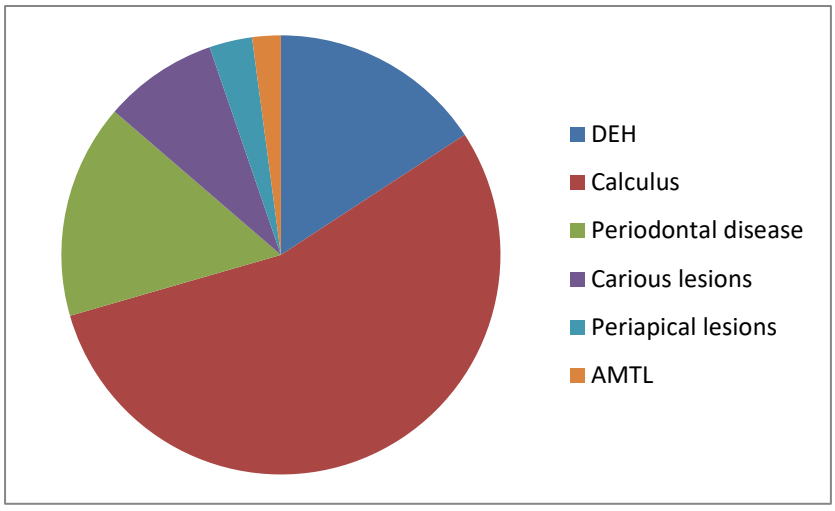

Figure x.3. Distribution of dental diseases (rate per tooth and/or tooth position).

Mineralized plaque (calculus) affected nine sexed individuals (SK3, SK4, SK5, SK6, SK8, SK9, SK11, SK12 and SK13). The affected teeth were characterised by slight to severe supragingival (above the gum) and supra/subgingival (above and below the gum) deposition

of mineralised plaque (Figure x.4a). Calculus deposits were recorded on 51.5 per cent of all observable teeth (Table x.2). All sexed (71.4%) individuals' prevalence rate of calculus substantially exceeded the early medieval average for Britain (39.2%: Roberts and Cox 2003, 194: Table 4.17) and suggests poorer oral hygiene and/or higher protein diet among the analysed population.

Hypoplastic defects of enamel are formed due to growth disruptions to the cells producing enamel matrix (Hillson 1996). Linear enamel hypoplasia was observed on nine individuals, including all identified males (SK3, SK54, SK5 AND SK9) and females (SK6, SK8, SK11, SK12 and SK13) (Figure x.5, Figure x.4a). Of all the observable teeth, 15.5 per cent displayed LEH, with females/?F manifesting a considerably higher prevalence of hypoplastic defects (23.9%) than males/?M (7.1%) and such differences also occurred in other contemporaneous sites (Roberts and Cox 2003, 188: Table 4.8). The prevalence rate of the latter group nearly mirrored the average estimated for pooled sexes for that period (7.4%) (Roberts and Cox 2003, 188: Table 4.8). The presence of hypoplastic defects of enamel within the population cemetery indicates the individuals endured early in life a period of stress in form of either low birth weight, malnutrition, diabetes or major infections. Higher prevalence of LEH among females suggests that girls were exposed to higher level of nutritional stress or a heavier pathogen load than their male counterparts.

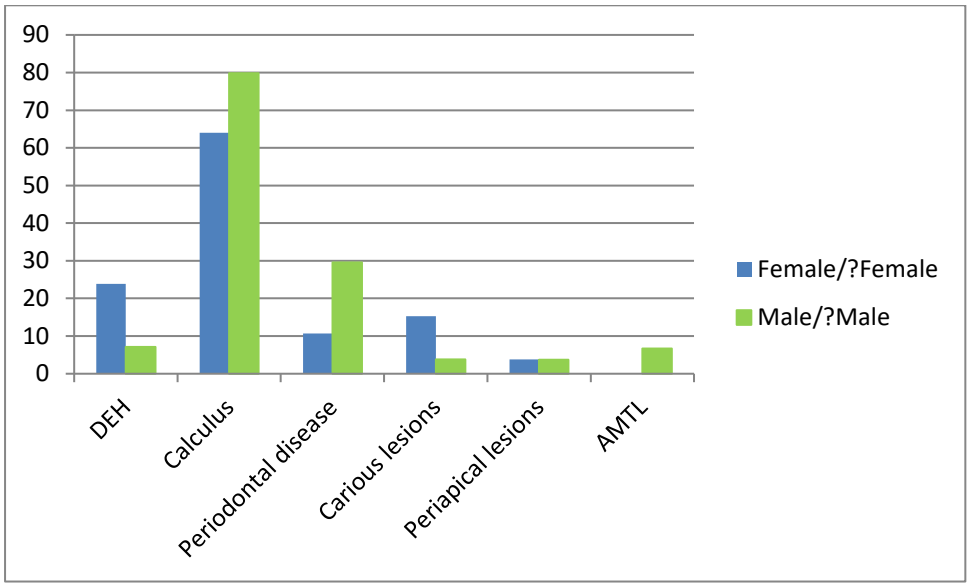

Figure x.5. Distribution of dental diseases of sexed individuals (rate per tooth and/or tooth position).

Periodontal disease originates as an inflammation of soft tissues (gingivitis) that subsequently extends to the bone (periodontitis), which results in increased distance between the bone and cemento-enamel junction (CEJ) of a tooth. Male (SK5) and ?female (SK12) manifested evidence of predominantly advanced (stage 3) periodontal disease (Figure x.4a, b). Of all observable teeth 15.3 per cent displayed periodontitis. The aetiology of the disease is multifactorial with diets rich in sucrose, poor oral hygiene, the presence of calculus and increasing age being major contributory factors. Plaque formation (SK5, SK12) and age (SK5) likely contributed to the development of periodontitis observed within the assemblage.

Dental caries result from fermentation of food sugars by bacteria present in dental plaque.

Five individuals, three female/?F (SK11, SK12 and SK13) and two males/?M (SK3 and SK5) and a total of 7.5 per cent of all teeth were affected by carious lesions (Figure x.4d). The value exceeded the mean calculated for contemporaneous populations (4.2%: Roberts and Cox 2003, 191: Table 4.14). Females/?f seemed to displayed more cariotic teeth than males, a pattern commonly found within early medieval populations in Britain (*ibidem*).

Periapical lesions include abscesses, cysts and granulomata. Of all observable tooth sockets within the assemblage, 2.9 per cent (Table x.2) were affected by periapical lesions, nearly mirroring the average for contemporaneous assemblages (2.8%, Roberts and Cox, 2003, 192). Two females/?f (SK12 and SK13) and one male (SK5) suffered from the disease(Figure x.4b, f). Dentine exposure resulting from advanced wear of molars (Figure x.4c) likely contributed to the periapical lesions of mature adult SK5, whereas dental caries were identified as the underlying cause of the lesions in both females.

Ante-mortem tooth loss (AMTL), or the loss of teeth during life, can occur as a result of a variety of factors, including dental caries, pulp-exposure from heavy tooth wear, or from periodontal disease. Ante-mortem tooth loss affected a single male (SK5) (Figure x.4a, b) and 2.5 per cent of all observable teeth/tooth positions (Table x.2). Mature adult male SK5 suffered from an extreme dental wear (Figure x.5a) and from all of the previously discussed dental diseases, suggesting that the aetiology of AMTL was likely multifactorial with advancing age constituting the major contributory factor. Considering that tooth loss count is accumulative and increases with age, the observed low prevalence rate of AMTL in comparison to othercontemporaneous sites (14.1%, Roberts and Cox 2003, 135), is likely reflective of the overall young age of the analysed population.

Two individuals presented bilaterally retained roots of deciduous teeth between the upper premolar and molar (SK8, SK13) (Figure x.4e). Retention of the milk tooth root at the position of the upper first molar coincides (SK13) with impaction of an incompletely formed single-root tooth visible within the right maxillary sinus (Figure x.4f) proximal to a maxillary periapical lesion of first molar.

Both second molars of individual SK13 showed abnormally developed roots, straddling the alveolar sockets and entering the mandible from the labial aspect of the mandible.

Three individuals (SK1, SK8 and SK12) presented atypical tooth wear. Individual SK1 showed upper deciduous incisors worn to the pulp chamber. General wear suggests overbite possibly associated with OA TMJ affecting the individual. Similar type of malocclusion likely affected individual SK8. Contrastingly, female SK12 displayed an abnormal wear of labial aspect of anterior teeth, possibly relating to an underbite. Upper first molars (SK12) showed further unusual smooth wear of the buccal aspects of teeth at the cement-enamel junction.

Skeletal pathologies

Congenital diseases

Congenital abnormalities were observed in eight skeletons and constituted the most frequent type of pathologies observed within the assemblage.

Hydrocephaly (water on the brain) presents itself as an abnormally enlarged cranium caused by an increased accumulation of cerebrospinal fluid within the skull due to either

developmental disturbances, trauma, infection or brain tumors. Adolescent SK6 displayed anteriorly, superiorly and laterally bulging thin-walled cranial vault (Figure x.6a), which was accompanied by an overall small of the maxilla and the mandible, giving an appearance of a disproportionately small face, as well as by retention of metopic suture and the presence of an ossicle at lambda. The features were consistent with the late onset of hydrocephalus, which would induce a variety of physical, behavioural and cognitive impairments, including loss of coordinated movement. Smaller than expected dimensions of sella turcica, a seat for the pituitary gland, was observed in the skull, suggesting that individual SK6 may have suffered consequences of diminished activity of the pituitary gland (hypopituitarism), such as delayed growth, obesity, and general weakness. The diaphyseal age of adolescent SK6, produced an age range of 9-11 years (Maresh 1970 in Scheuer *et al*. 2008) suggestive of possible stunting. Individual SK8 also shared the main characteristics of hydrocephaly, namely an enlarged thin-walled cranial vault. Other abnormal features present included multiple ossicles, hyperplasia of the coronoid process and a laterally flattened condyle. Severe fragmentation of the skull precluded its detailed inspection, however upon a nearly complete reconstruction of the vault, a globular shape of the cranium, such as seen in individual SK6, was obvious.

Both adolescents (SK6 and SK8) showed cleft neural arches of sacrum or spina bifida (Figure x.6b, c). Individual SK6 presented complete (S3 and S4) and partial (S2) cleft of sacral neural arch. Similarly, SK8 showed a complete (S2, S3) and partial (S4) cleft (Figure x.6d). The appearance of the arches suggests the abnormality was asymptomatic (Barnes 2012) and represented a failure of joining ossification with a fibrocartilage holding neural arch together. Notwithstanding, considering the morphology of the skulls and a smooth lined lytic endocranial lesion of SK6, it is justified to propose that the observed sacral deformity may relate to a more severe form of spina bifida. Combined characteristics of adolescents SK6 and SK8 suggest the individuals may have suffered from spina bifida hydrocephalus, symptoms of which were delayed until the adolescent growth spurt.

Vertebral border shift is regulated by a combination of genetic codes and manifests itself as an absorption by a vertebral segment of characteristics of the vertebral section located above (caudal shift) or below (cranial shift) the designated border. Three individuals manifested a supernumerary vertebrae, expressed as sacral (SK5) (Figure x.7a), thoracic (SK6) and lumbar (SK9) elements. Transitional thoracic vertebra (T13) in adolescent SK6 articulated with a right supernumerary rib. Further developmental defect of the spine (SK6) included a caudal shift of the cervical-thoracic border, evidenced by an extra right rib showing articulating facets at both ends (Figure x.7b). Skeleton SK12 manifested an incomplete caudal shift (Barnes 2012) of the lumbar-sacral border, whereas vertebral column of adult male SK9 shows supernumerary lumbar vertebrae at the thoracic-lumbar border.

Abnormal development of the chest of SK9 was further expressed by a depressed portion of mesosternum, forming a moderate/severe expression of funnel chest (pectus excavatum). Mild forms of this pathology are asymptomatic, whereas severe type may affect respiration and displace heart (Barnes 2012).

Symphalangism of the fifth toe affected adult male SK4 (Figure x.7.c). This relatively frequent developmental defect results from a failure of segmentation of adjacent phalanges resulting in the absence of interphalangeal joint (Barnes 2012). This condition would prevent movement of the most distal portion of the fifth toe.

Hyperplasia of coronoid process was relatively frequently identified and affected a ?male (SK3)(Figure x.7d) and a ?females (SK8) alike. Enlarged coronoids occurs predominantly in males of the same family (Barnes 2012) and cause inability to fully open the mouth due to impingement on the zygomatic bone.

Mature adult SK5 showed a segmented bipartite patella (Figure x.7e), commonly considered to represent a failure of coalescence of ossification centres. Bipartite patellae occur predominantly in males in approximately two per cent of the population (after Mann 2012: 168).

Both, female (SK11) and male (SK5), mature adults showed evidence of os acromiale, representing a failure of fusion of lateral ossification centre of the acromion process of scapula. The aetiology of os acromiale, typically recorded as a non-metric trait, is disputed and considered hereditary or occupational with stresses associated with archery proposed as the contributory factor.

Individual SK3 displayed a possibly developmental in origin bilateral pathology of clavicles in the form of abnormal apertures in the superior aspects of the centres of the lateral halves.

Metabolic diseases

Cribra orbitalia (CO) involve fine pitting in the orbital roof, originating in childhood and usually receding during adolescence or early adulthood. A single juvenile (SK1) and an adult male (SK9) showed pitting of orbital roofs (Figure x.8a). Cribra orbitalia is predominantly caused by anaemia, which can be linked to dietary deficiency, parasite load and blood loss (Walker *et al.* 2009). The pathology has often been found in association with agricultural economies with frequency in early medieval populations at the level of 7.6% (crude prevalence, in: Roberts and Cox 2003, 187, Table 4.11).

All the elements of mature adult female SK11 manifested a suite of osteoporosis-related features (Brickley and Ives, 2008) including an overall light weight of bones, cortical thinning as well as loss and thickening of trabeculae. Further changes included biconcave deformity of multiple vertebrae, increased width of the medullary cavity and severe intra-cortical porosity of the long bones (Figure x.8b). Post-menopausal bone remodelling imbalances and age were likely factors in the pathogenesis of osteoporosis observed in female SK11. The compromised structure of all the elements undoubtedly contributed to the exceptionally high post-depositional fragmentation of bones.

Non-specific infections

Periostitis is a non-specific infections of the periosteum - a layer of soft tissue covering the outer surface of the bone. It affects predominantly tibiae, and in palaeopathology is most

frequently observed among settled agricultural populations (Roberts and Manchester 2010). Periostitis manifests as fine pitting, longitudinal striation and eventually plaque-like new bone formation, however it is very unlikely to produce debilitating symptoms.

Both tibiae of individual SK12 showed remodelled lamellar bone, representing bilateral periostitis that had subsided some time before death. Unilaterally active forms of the inflammation presented as woven (immature) bone affecting the right tibiae of mature adult SK5 and posterior aspect of left tibia of juvenile SK7. A variety of causative factors have been proposed for periostitis, including infections (most prevalent), chronic ulceration haemorrhage and low-grade trauma (Aufderheide and Rodríguez-Martín, 1998).

Trauma

Individual SK4 manifested a healed isolated, possibly oblique, fracture of the mid-shaft of the right radius. Although a radiographic image was not available, angulation and a considerable apposition (within the 25-50% range) of the two halves were noticeable (Figure x.8c). The fracture resulting in the reduction of the radial shaft‘s length by 90mm in comparison to its left counterpart, likely compromised the stability of the distal radial ulnar joint and, indeed carpal elements (scaphoid) showed abnormal shape and vascularisation. Two cloacae suggested a degree of osteomyelitis, an inflammation of the medullary cavity. Isolated radial shaft fractures are relatively uncommon and result from either a direct blow to the forearm or a fall on outstretched hands.

The same individual showed *osteochondritis dissecans* of the distal articulation surface of the right metatarsal. The scooped-out lesion has been linked to acute trauma, abnormal ossification of the epiphyseal cartilage and to hereditary influences.

A single well healed rib fracture located near the angle was identified in skeleton SK12. The rib fragments were partially apposed and produced a degree of angulation. The fracture’s appearance suggests application of the force from the front due to stress fracture or, more likely a direct trauma such as a blow or a fall against a hard object (Lovell 1997).

Individual SK13 manifested a mild case of *myositis ossificans* (18x30mm) in the medial supracondylar ridge of the right femur, indicating trauma to the *adductor magnus* muscle and subsequent ossification (Figure x.9c). The individual also showed a pronounced *linea aspera*, a main insertion for the muscle.

Rotator cuff disease (RCD) is the most common pathology of the shoulder in modern clinical context although is infrequently identified in archaeological context. A possible bilateral RCD, involving a minimum a subscapularis muscle, affected older female (SK11). The pathological changes of the shoulder complex were present in the incompletely preserved proximal ends of both humeri and the only surviving articulation facet of acromion (left) (Figure x.8d). The changes included porosity, subchondral cysts and altered bony contour of lesser tubercles of humeri as well as a 6mm in diameter, lytic lesions located medially from greater tubercle and finally porosity, osteophytes and contour change of acromial articulation facet (left). RCD in individual SK11 coincides and potentially is related (Park et al. 1994) to

the presence of os acromiale. Considerably expanded attachments for deltoid (deltoid tuberosity) and supinator (supinator crest of ulna) muscles were observed. The enlargement of deltoid tuberosity may represent a compensatory deltoid muscle function preventing abduction motion loss due to RCD (Dyrna et al. 2018). Aetiology of RCD may include trauma, inflammation and degeneration due to ageing.

Joint disease

Osteoarthritis (OA) is a common joint disease characterised by a loss of articular cartilage and the subsequent reaction of the subchondral and marginal bone. Factors contributing to the development of OA include injury/activity-induced alteration of the joint, age as well as systemic and genetic predispositions (Rogers and Waldron, 1995). The condition may manifest itself in the form of the pitting of the articulation surface and osteophytes, whereas eburnation (polishing) of the joint surface is considered a definite diagnostic feature of osteoarthritis. OA is believed to be a product of a normal remodelling or repair process to a synovial joint failure.

Osteoarthritis of tempo-mandibular joint (OA TMJ) affected two sub-adult individuals SK1 and SK8. The condition may be related to a variety of causes including developmental and endocrine disturbances, birth injuries, infections and metastatic malignancies and to mechanical stress. Unilateral OA TMJ of juvenile SK1 presented as an area of eburnation (polishing) (30x50mm) on left condyle and the corresponding condylar fossa. Considering a substantial wear of the maxillary incisors it is plausible to conclude that OA TMJ of SK1 was related to masticatory stress caused by for example bruxism. A flattened condyle of SK8 may represent a possible early stage of OA TMJ.

Mature adult SK5 was suffered from widespread osteoarthritis affecting right shoulder, elbow, hand and whole spine. Pronounced marginal osteophytes of proximal ulna resulted in an inability to fully extend right arm (Figure x.9a). The likelihood of contracting OA at elbow increases with age and repeated strenuous manual activity.

Spinal osteoarthritis affected two adult males with transitional vertebrae, SK5 and SK9 (Figure x.9b). The individuals showed mild form of the OA in a proportion of the cervical vertebrae and moderate to severe type of the whole thoracic section of the spine. Frequently observed polishing of the joints affected by OA in individual SK9 indicated the person remained active despite widespread and painful changes to the bone.

Further changes to the spine of individuals SK5 and SK9 included intervertebral disc disease (IDD), which results from a rupturing and herniation of the discs and manifests itself as pitting on vertebral bodies. Both males manifested pitting accompanied by widespread advanced (SK5) and occasional slight (SK9) marginal osteophytes of bodies of lower lumbar section of spine (SK9) and complete vertebral column (SK5)(Figure x.10e).

Schmorl's nodes (SN) represent a partial displacement (herniation) of the intervertebral disc into the vertebral body (Rogers and Waldron 1995). They occur most commonly in the lower thoracic and lumbar region, in the upper and lower surface of its bodies and manifest as a

depression and a smooth lining of the cortical bone. Adult male SK9 and individual SK13 shown SN of the lower thoracic (both) as well as a partial (SK13) and complete (SK9) lumbar section of the spine (Figure x.9c). Mature adult SK5 presented an isolated SN of the thoracic vertebra (T7). Further evidence of spinal changes in the form of ossification of *ligamentum flavum* was identified in four lower thoracic vertebrae of individual SK13.

Neoplastic disease

Young female SK13 showed three nodules, 4-5mm in diameter, and one smaller nodule (2mm in diameter) circumscribing the posterior portion of the parietal bones (Figure x.10a). Although the definite diagnosis could not be provided due to root etching obscuring the lesions, the nodules likely represent benign slow-growing button osteomas.

Endocranial lesions

New bone formation (NBF) on the endocranial surface of the skull vault results from inflammation or haemorrhage of the meningeal blood vessels. Endocranial woven (immature) new bone was identified covering most of the endocranium, including greater wings of sphenoid, of adolescent SK2. The NBF was most prominent within sulci, specifically in superior saggital sulcus and right transverse sinus sulcus (Figure x.10b). Pathogenesis of the lesion is unknown, and may include chronic meningitis, trauma, anaemia, neoplastic disease (cancer), metabolic diseases (scurvy and rickets), venous drainage disorders and tuberculosis (Lewis 2004).

Hematological disorders

Female SK12 showed considerable thinning of skull tables as well as marrow hyperplasia resulting in diploid expansion of up to 12mm in cross-section. Cranial marrow hyperplasia is typically associated with anaemia. Differential diagnosis includes chronic haemolysis, cyanotic heart disease and nutritional disorders.

Activity induced skeletal changes

Two individuals SK5 and SK9 shared a pattern of skeletal changes proposed (Berthon 2019) as attributable to habitual horse-riding (Figure x.12). The changes included enthesophytes distributed across the elements carrying insertions for the specific muscles of femur (*linea aspera*, adductor tubercle), tibia (soleal line- exclusively SK5; ischial tuberosity), calcaneum (calcaneal tuberosity) and pelvis (anterior inferior iliac spine, exclusively SK5). Further shared features comprised Poirier's facet of the femora, exostosis in trochanteric fossa, Schmorl's nodes and verticalisation of the acetabulum (here visually assessed). Possible female SK13, showed a proportion of these characteristics, accompanied by discussed above trauma to the adductor muscle of the femur. Further studies are recommended to verify habitual riding of horses within that population.

5.2.7 Conclusions

The articulated human remains included individuals of both sexes and all ages. Average male stature mirrored a typical height for contemporaneous men, whereas females proved to be slightly smaller than the early medieval average for women. Metric analysis as well as a distribution of normal variation traits suggested the individuals form a largely homogenic population with a possible outsider (SK10). Overall levels of dental diseases were typical for the early medieval period with the exception of increased calculus prevalence suggestive of poorer oral hygiene. The population displayed a considerable amount of congenital abnormalities with spinal diseases occurring most frequently and two possible cases of hydrocephalus with late onset of symptoms. Degenerative changes to the spine coincided with the presence of features considered markers of horse-mounting.

The absence of grave goods from the burials is consistent with notion by Hines and Bayliss (2013) of a rapid decline in the use of graves goods in mortuary practice during the late 7th century. The roughly east-west alignment of the Stanton Harcourt Airfield graves, as well as the predominantly extended, supine positions of the individuals suggested the cemetery served a small population largely converted to Christianity. A single deviation from the dominant burial practice constituted an inhumation of an early adolescent individual (SK10) lay in a crouched, semi-prone position, which was not dictated by any underlying skeletal deformity.

5.2.8 Recommendations

Good preservation, relatively low fragmentation as well as high observability of non-metric traits and such incidence of pathological conditions marks the assemblage as a valuable resource for further potential research. Similarly, a high proportion of elements typically used in a destructive sampling in aDNA (petrous part), stable isotopes analyses (tooth enamel) and other were noted (Table x.3). It is recommended to retain the assemblage for further study. Radiocarbon dating and strontium isotope analysis of individual SK10 and any individual from within a normative for the site burial may explain the dissimilarity of burial practices via comparison of childhood provenance of the individuals and verification of contemporaneity of the burials.

	Sk1	Sk2	Sk3	Sk4	Sk5	Sk6	Sk7	Sk8	Sk9	Sk10	Sk11	Sk12	Sk13	Sk16
Petrous part	g	g	m	g	m	g	g	g	g	g	m	g	n	n
Tooth enamel	g	g	g	g	g	g	g	g	g	g	g	g	g	n
Calculus	n	n	p	p	m	n	n	m	m	n	m	m	m	n

Table x.3. Preservation of unburnt elements normally used in destructive sampling (good, moderate, poor, none).

5.3 Results: Cremated bone

All cremated bone from contexts (3055), (3057), (3064) and (3071) was analysed. The results of the analysis were tabularised (Table x.4). Cremation-related deposit (3064) and (3057)

were additionally discussed in detail below. Complete inventory of identified fragments is presented in Appendix X.

context number	(3055)	(3059)	(3057)	(3064)	(3064)	(3071)
sample number	29	31	n/a	n/a	n/a	36
total weight (grams)	0.1	0.3	85.0	3743.3	39.9	0.6
identification	human?	unident.	human	human	large mammal	human?
age	unident.	unident.	adolescent/adult	adult adolescent/juvenile	unident.	subadult?
minimum number of individuals	1	1	1	2	1	1
area present	n/a	n/a	skull, axial, limbs	skull, axial, limbs	forelimb	skull (tooth root)
identified to an element	0.0%	0.0%	7.4%	24.2%	62.1%	16.6%
colour	white+++	white+++ grey+	white+++ white/black + grey+	white++++ white/grey++ white/black+ mixed brown+	black+++ grey+++ mixed + brown+ black/white++	white++ white/black+
fragmentation	high	high	high	high	low	moderate
>10mm weight (%)	0.0	0.0	100	48.9	100%	50.0
<10>5mm weight (%)	0.0	10.0	0.0	41.1	0.0%	40.0
<5>2mm weight (%)	100	90.0	0.0	10.0	0.0%	10.0
maximum size of skull fragment (mm) (post-excavation)	n/a	n/a	29	48	n/a	7
maximum size of long bone fragment (mm) (post-excavation)	n/a	n/a	31	72	62 (refitted)	n/a
maximum fragment size(mm) (post-excavation)	4	6	31	82	62 (refitted)	11
heat induced changes (fissuring pattern and warping)	unobserva.	unobserv.	u-shaped transverse longitudinal dendritic warping	u-shaped transverse longitudinal dendritic warping	none	unobserv.

Table x.4. Fragmentation, demography, preservation and dehydration of cremated bone.

Burnt bone from deposits (3064) and (3057)

5.3.1 Weight

The weight of the cremated bone has the potential to inform on the cremation process including pyre technology, collection and bone deposition. It may also be influenced by age and sex of the individuals, the level of protection offered to the cremated remains within the

burial environment as well as the level of pit disturbance. Lastly, exceptionally large weight may indicate the presence of more than one individual within a cremation burial and identify a potential primary burial within a cremation cemetery.

Cremated human bone weighted 3778.6 grams, vastly exceeding a mean weight of bone samples typically retrieved from primary Bronze Age barrow burials (1052g) (McKinley 1997). The weight of burnt bone from context (3064) is suggestive of multiple individuals and a whole-body deposition.

5.3.2 Fragmentation

Fragmentation of bone is a result of pre- and post-burial activities, which starts with the process of cremation and continues during subsequent collection by means of raking the hot bone from the pyre site, interment, excavation, transportation and post-excavation processing (McKinley 1994). Dehydration increases likelihood of bone to fracture.
It has been demonstrated that fragment sizes should be regarded as post-excavation fragment sizes rather than those of deposited fragments (McKinley 1992 1994).

Within the investigated assemblage cremated remains the maximum size of specimens was relatively high for long bones and skull (72mm and 48mm respectively), which is expected in urned burials. Notwithstanding, over 50% of the total weight of the cremated bone consisted of fragments smaller than 10mm (Table x.4), indicating high fragmentation level of the material in comparison to the average calculated for 4000 pooled urned and unurned deposits from Britain (McKinley 1994).

5.3.3 Skeletal elements

Representation of skeletal elements can inform on the pre-cremation condition of human remains and on the funerary practice. In order to aid interpretation of funerary behaviour the weights of each skeletal region expressed as a proportion of the total weight was compared (Table x.5) to the expected proportion estimated for the modern cremated remains (Gonçalves 2011a) and more detailed group weights of skeletal elements and fragment size range are shown in Table x.6.

Skeletal element distribution of burnt bone from deposits (3064) and (3057) produced similar and expected results, showing the largest proportion of all fragments representing limbs (above 50%), followed by skull (under 40%) and axial portion (under 5%) (Table x.5). The most striking deviation from a natural anatomical weight proportion was observed in the axial skeleton (4% *vs* 21%). This is a common occurrence that could be explained by preferential destruction of trabecular bone of the axial elements (McKinley 2004) and therefore is not an evidence for their deliberate exclusion during bone collection. Higher proportion of cranial elements (over 30% *vs* 18%) can be attributed to the higher probability of identification of cranial fragments, some of which were measuring barely 5mm, which constituted the smallest identified fragment size. In conclusion skeletal element distribution suggested the primary cremation of articulated bodies.

Area of body	3064	3057	Normal distribution (%)
Skull	32.8	37.8	18.0

Axial (excluding skull)	4.7	4.0	21.0
Upper/lower limbs	62.5	58.1	61.0
Total	100	99.9	100

Table x.5 Fragmentation of the burnt bone from contexts (3057) and (3064).

All major elements of the axial and appendicular human skeleton were present within cremation deposit from urned deposits (3064) and (3057)(Table x.6). Limited number of skeletal elements was identified within the remaining burnt bone deposit.

	(3057)				(3064)			
group	weight (g)	max. size	min. size	colour*	weight (g)	max. size	min. size	colour*
teeth	0				5.2	14	5	w++, w/g+
skull	20.7	29	11	w	426.3	48	10	w+++, w/g+, m+
vertebrae					39.5	38	10	w+++, g+
ribs	2.2	31	11	w	22.4	35	11	w
clavicle					1.7	35	35	w
scapula	2.0	24	24	w	10.6	40	22	w
humerus					36.1	55	18	w
radius					15.2	52	11	w+++, g+
ulna					5.0	35	35	w
metacarpals					2.4	27	20	w
phalanges - hands					5.0	25	8	w+++, g+
sesamoid					0.3	10	10	w
pelvis					24.2	82	20	w+++, g++
femur					103.4	63	20	m+++, w+
patella	2.4	25	25	w	0.0			
tibia					44.9	72	30	w
fibula					16.8	32	8	w+++, g+
metatarsals					2.2	30	30	w
mtp +phalanges					13.9	30	7	w

cancellous bone					64.5	25	11	w+++, g+
lower limbs	4.7	31	11	w	71.7	50	10	w/b
upper limbs	13.1	25	11	w	75.5	51	10	w+++, w/g+
long bone	9.6	31	11	w	392.7	60	11	w+++, g++, b+
unidentified to element	30.3				2338.7			
*w- white, g- grey, b- black, m-mixed								

Table x.6 Group weights and fragment size range of human bone, (3064).

5.3.4 Minimum number of individuals

Duplication of identifiable elements and age related differences (size, development and morphology) within one cremation deposit may indicate the presence of elements of multiple individuals. Repeated elements – mandible and the petrous part of the temporal bone indicated the presence of a minimum two individuals within deposit (3064).

5.3.5 Age and sex

Funerary practices may differ according to the age or sex of a deceased individual. Biological sex of an individual can be established by macroscopic examination of the cremated remains as well as via metric analysis as a heat-related dimensional change of the bone does not have a significant impact on osteometric sexual dimorphism (Gonçalves 2011b).

All the elements present within cremation deposit (3064) were fused, indicating they represent at least one adult. The size of petrous part suggested presence of second adolescent/adult individual. The robustness of the skull elements also suggests the presence of an adult and a possible subadult individual. Based on the robustness of the elements cremation deposit (3057) included at least one adolescent/adult individual. None of the cremated bone elements produced any diagnostic fragments that would aid sex estimation. High fragmentation of bone precluded metric analysis.

5.3.6 Metric and non-metric traits

No metric data as well as non-metric data were obtainable for any of the elements.

5.3.7 Pathology

Deposit (3064) included right and left condyle manifesting osteoarthritis of tempo-mandibular joint and a cervical vertebral body with grade II marginal osteophytes (Figure x.11). Both pathologies affect predominantly adults and are discussed in more detail in Section x.2.6.

5.3.8 Efficiency of cremation

Cremation efficiency relies on temperature and time of burning. The process of cremation is one of dehydration and oxidation of the organic components of the body.

Oxidation

Complete burning results in complete oxidation of the organic component of bone, leaving only the mineral portion of the skeleton (McKinley, 1994). Experiments have proved that the

colour of the bone reflects the temperature it attained during cremation and could therefore act as a proxy for oxidation level (Shipman et al. 1984, Holden et al 1995):

Brown/black bone= charred (c.300°)
Blue/grey bone= incompletely oxidised (c.600°)
White bone= completely oxidised (>600°)

As the level of the organic content of the bone and thickness of soft tissue cover influence the degree of oxidation it is not unusual to see a range of colours within one burial or even on a single bone fragment.

The bone from cremation deposit (3057) was fully oxidised. The overall appearance of the cremated remains suggested the efficient cremation of fleshed cadavers in temperatures exceeding 600°c. Contrastingly, a considerable variation in oxidation level was noticed for burnt bone from context (3064). Whereas majority of elements were completely oxidised inner aspect of skull vault, pelvis and robust portion of legs included a sizable proportion of charred (black, brown) or incompletely oxidised (grey, mixed) fragments (Table x).

Dehydration
Heat-induced warping and fissuring/fracturing patterns can aid determination of the pre-cremation condition of human remains (*i.e.* fleshed vs defleshed) and potentially support identification of secondary (to excarnation) cremations. Although in modern settings warping and thumbnail fracturing of the bone has been sporadically observed on the cremated 'dry bone' (i.e. defleshed prior to cremation) (Gonçalves 2011a), they are much more typical of cremations on fleshed cadavers and green bones.

The fissuring patterns identified within each cremation as well as the warping and colour of the bone per cremation is presented in Table x.4. Deposits (3057) and (3064) contained features indicative of cremation of fleshed bone.

5.3.9 Pyre goods
Cremation deposit (3064) contained a small proportion of large mammal bones, including humerus (Table x) and unidentified long bone shafts. The latter displayed three parallel oblique butchery cuts. The fragments were black or grey or mixed indicating a low level of oxidation and displayed absence of fissuring pattern and warping. Cremation deposit (3064) additionally included 38.4 gram of unidentified (human or animal bone) displaying a lack of dehydration features similar to the animal bone discussed above. Deposition of burnt animal bone with cremated human remains occurred frequently in Early Medieval period (Bond 1996), with sheep/goat and horse constituting the most common species.

5.3.10 Spatial distribution of urned cremated bone
Analysis of the spatial distribution of skeletal elements of cremation deposits from deposit (3064) was unfeasible. Notwithstanding, high fragmentation of bone, that impacted negatively on elemental identification, would preclude reliable inferences on spatial elemental distribution.

5.3.11 Cremated bone discussion
Preservation of cremated bone was good, allowing for the identification of pathological conditions. The high level of bone fragmentation, of likely multifactorial aetiology, reduced the level of identifiability of fragments and precluded observation of measurement and

normal variation traits. The fracturing and fissuring patterns suggested cremation of fleshed cadavers. Despite small amount of bone within context (3057), both cremation-related material, (3064) and (3057), included bone from all the areas of the skeleton, comprising skull, axial and limbs and suggested a whole body deposition. Provided no hidden taphonomic factors contributed to the overall low weight of bone, context (3057) represents a token deposit of efficiently cremated adolescent/adult individual.

Deposit (3064)
Variability of the oxidation level between elements of cremated bone from deposit (3064) indicates an uneven, inefficient cremation, which reflects insufficiency of either time, fuel or oxygen and may be related to *e.g.* a structurally compromised pyre or a possibly dual cremation. The weight of the cremated bone vastly exceeded the expected value and certainly is related to the proven presence of the minimum two individuals as well as to the inclusion of heavier, incompletely oxidised, elements. Notwithstanding, when the presence of exactly two individuals is assumed, the weights are still greater than the expected average established for past cremations. It has been suggested that in archaeological contexts whole body deposition should produce weights ranging between 1001.5g and 2422.0g (McKinley 1993). The high weight also reflects a meticulous, complete collection of all the elements of the burnt individuals evidenced by the inclusion of minuscule elements (sesamoid bones and carpals). High level of bone retrieval suggests expenditure of considerable time and human resources, which may reflect social, economic, popularity or other status of the individuals (McKinley 1997).

Sparsely present burnt large mammal bone was considerably less heat affected in comparison to the human burnt bone, suggesting either spatial (*e.g.* peripheral location on the pyre), temporal (shorter burning time) dissimilarities in treatment of the animal remains during funerary ritual. Presence of small amount of charred animal bone with butchery marks suggests deposition of a joint of meat, which may constitute a food offering, placed possibly at the periphery of the pyre.

5.3.12 Recommendations for future research
Currently the petrous part of temporal bone and teeth typically provide the highest probability of a successful extraction of aDNA. Exposure of the bones to temperatures exceeding 300°c precludes ancient DNA analysis for the majority of the bone; however few elements of the skull from deposit (3064)(charred/burnt robust femoral shaft and right petrous pyramid) may contain DNA remains that could potentially serve for future studies providing further developments in aDNA analysis. Further, petrous parts from individuals present in context (3064) may provide an opportunity to conduct strontium stable isotope analysis that could inform on the childhood origin of the individuals (Harvig *et al*. 2014).

It is recommended that all osteological material be retained for research purposes.

5.4 Animal bone within burial contexts

Contexts (2010), (SK7), (3078) and (3048) produced animal bone, tabulated in Table x. All the elements deriving from burial contexts showed rounding of bones and light brown colour, indicating non-primary deposition context and residual character of the finds. None of the elements showed gnawing or butchery marks.

context number	skeleton number	taxa	element	no. of refitted fragment	comments
(2010)	n/a	larga mammal	skull	12	
(2010)	n/a	mammal	unidentified	30+	
(2010)	n/a	micro mammal	humerus	1	
?(3050)	sk7	large mammal	pelvis	1	
(3078) <39>	sk11	sheep/goat	upper premolar	1	wear
(3048)	sk6	equid	molar/premolar	1	heavy wear
(3048)	sk6	large mammal	vertebra	1	
(3048)	sk6	medium mammal	radius	1	
(3048)	sk6	large mammal	rib	1	
(3048)	sk6	large mammal	long bone shafts and unidentified	6	
(3048)	sk6	sheep/goat/roe deer	metatarsal	1	
(3048)	sk6	sheep/goat	upper molar 1/2	1	heavy wear

Table x. 7. Animal bone.

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RADIOCARBON DATING CERTIFICATE

20 October 2020

Laboratory Code	SUERC-94920 (GU56196)
Submitter	Milena Grzybowska Archaeological Research Services Ltd. The Eco centre, Hebburn, Tyne and Wear, NE31 1SR
Site Reference	Stanton Harcourt Airfield
Context Reference	SK5
Sample Reference	SHMR18/01
Material	L ulna -complete : human
$\delta^{13}C$ relative to VPDB	-19.6 ‰
$\delta^{15}N$ relative to air	9.4 ‰
C/N ratio (Molar)	3.3
Radiocarbon Age BP	1296 ± 29

N.B. The above ^{14}C age is quoted in conventional years BP (before 1950 AD) and requires calibration to the calendar timescale. The error, expressed at the one sigma level of confidence, includes components from the counting statistics on the sample, modern reference standard and blank and the random machine error.

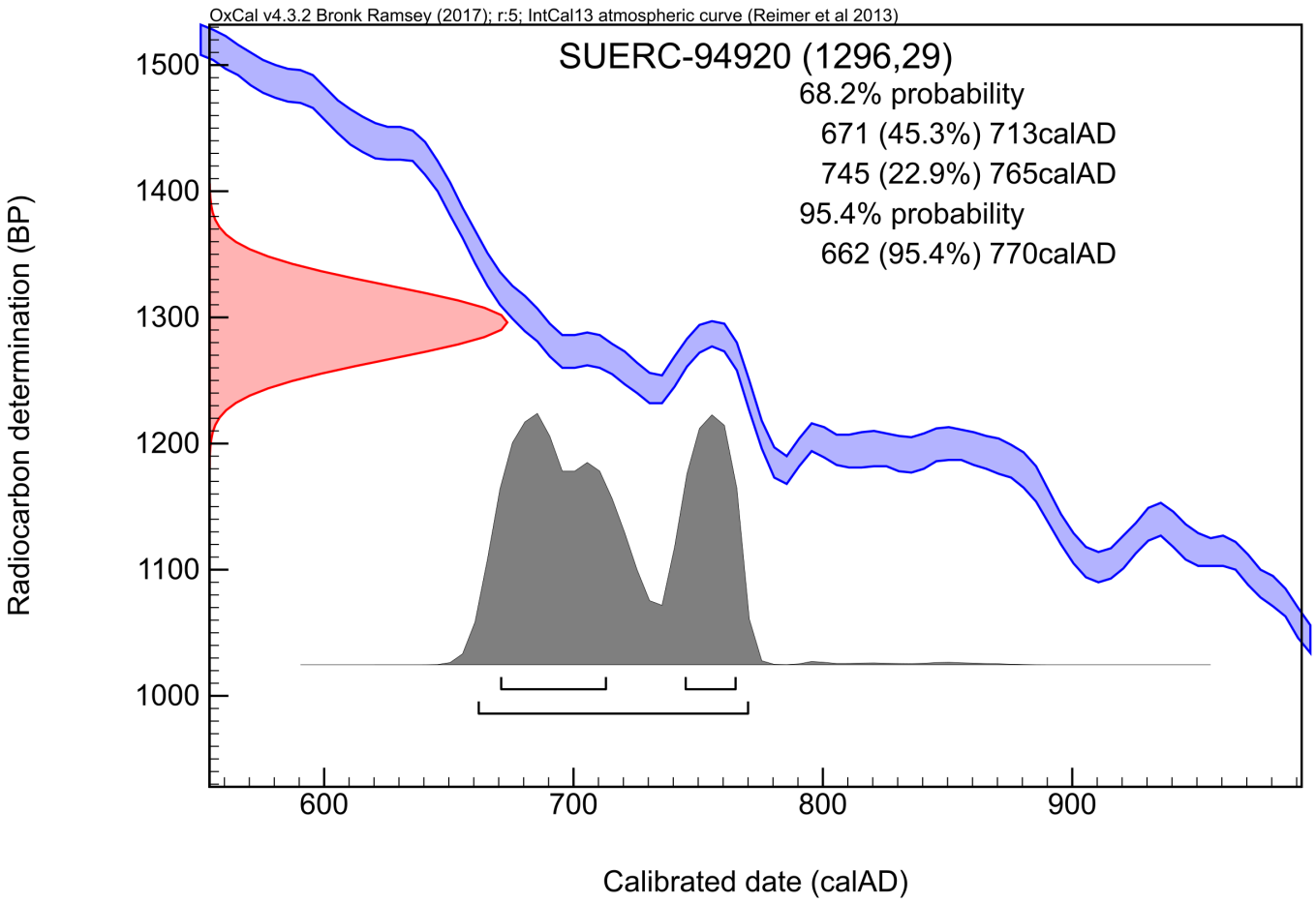
Samples with a SUERC coding are measured at the Scottish Universities Environmental Research Centre AMS Laboratory and should be quoted as such in any reports within the scientific literature. The laboratory GU coding should also be given in parentheses after the SUERC code.

Detailed descriptions of the methods employed by the SUERC Radiocarbon Laboratory can be found in Dunbar et al. (2016) *Radiocarbon 58(1) pp.9-23.*

For any queries relating to this certificate, the laboratory can be contacted at suerc-c14lab@glasgow.ac.uk.

Conventional age and calibration age ranges calculated by : E. Dunbar

Checked and signed off by :



The radiocarbon age given overleaf is calibrated to the calendar timescale using the Oxford Radiocarbon Accelerator Unit calibration program OxCal 4.*

The above date ranges have been calibrated using the IntCal13 atmospheric calibration curve†

Please contact the laboratory if you wish to discuss this further.

* Bronk Ramsey (2009) *Radiocarbon 51(1) pp.337-60*

† Reimer et al. (2013) *Radiocarbon 55(4) pp.1869-87*

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RADIOCARBON DATING CERTIFICATE

20 October 2020

Laboratory Code	SUERC-94921 (GU56197)
Submitter	Milena Grzybowska Archaeological Research Services Ltd. The Eco centre, Hebburn, Tyne and Wear, NE31 1SR
Site Reference	Stanton Harcourt Airfield
Context Reference	SK10
Sample Reference	SHMR18/02
Material	R femur - mid shaft : human
$\delta^{13}C$ relative to VPDB	-19.6 ‰
$\delta^{15}N$ relative to air	11.5 ‰
C/N ratio (Molar)	3.3
Radiocarbon Age BP	1201 ± 29

N.B. The above ^{14}C age is quoted in conventional years BP (before 1950 AD) and requires calibration to the calendar timescale. The error, expressed at the one sigma level of confidence, includes components from the counting statistics on the sample, modern reference standard and blank and the random machine error.

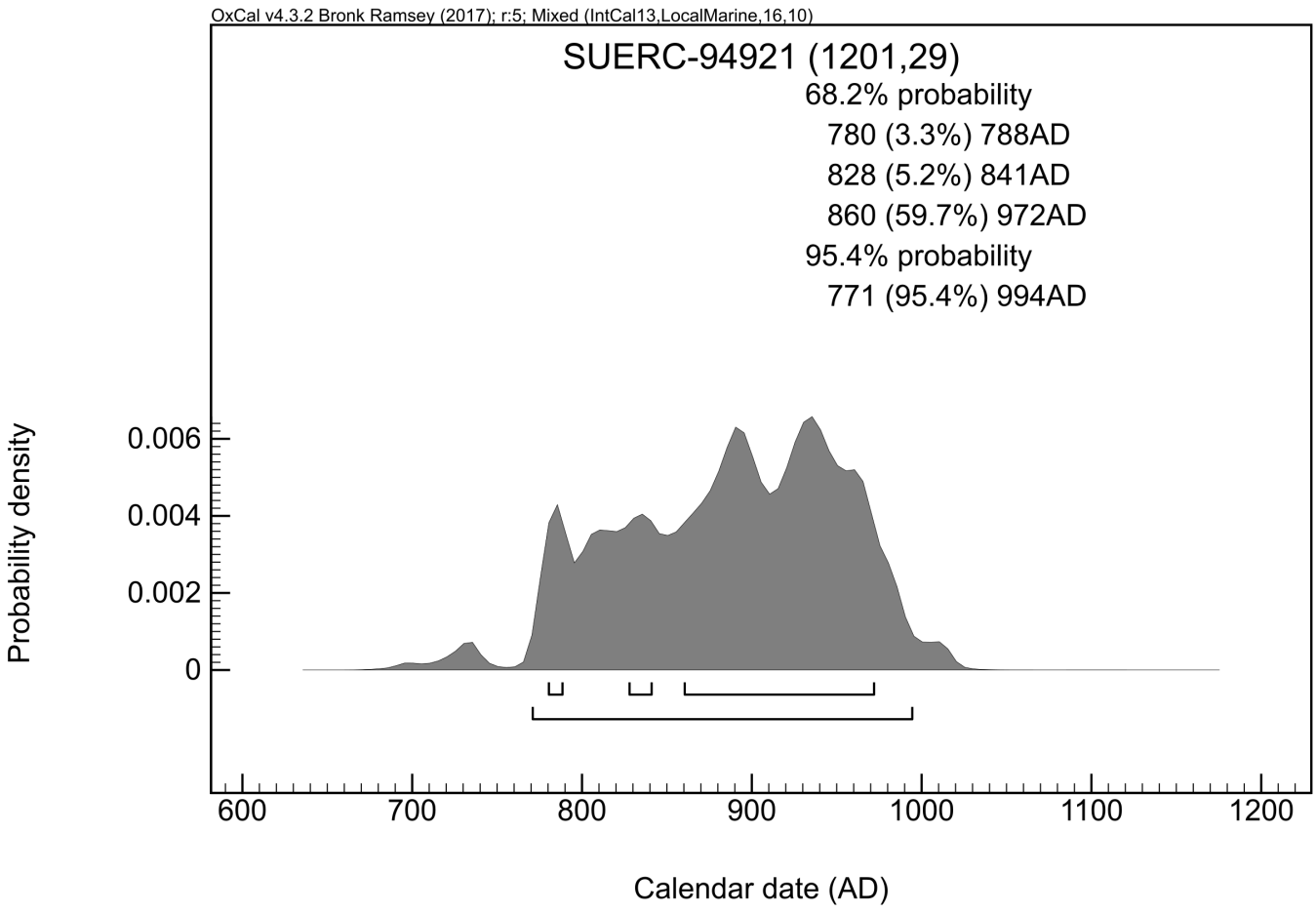
Samples with a SUERC coding are measured at the Scottish Universities Environmental Research Centre AMS Laboratory and should be quoted as such in any reports within the scientific literature. The laboratory GU coding should also be given in parentheses after the SUERC code.

Detailed descriptions of the methods employed by the SUERC Radiocarbon Laboratory can be found in Dunbar et al. (2016) *Radiocarbon 58(1) pp.9-23.*

For any queries relating to this certificate, the laboratory can be contacted at suerc-c14lab@glasgow.ac.uk.

Conventional age and calibration age ranges calculated by : E. Dunbar

Checked and signed off by :



The radiocarbon age given overleaf is calibrated to the calendar timescale using the Oxford Radiocarbon Accelerator Unit calibration program OxCal 4.*

The above date ranges have been calibrated using a mix of the IntCal13 and Marine13 calibration curves. †

Human bone collagen with a $\delta^{13}C$ value above -20‰, accompanied by a raised $\delta^{15}N$ value, is taken to indicate a marine component in the diet. The percentage contribution of this marine component is calculated using end-members of -21.0‰ (fully terrestrial) and -12.5‰ (fully marine) with an uncertainty of 10% applied.

The $\delta^{13}C$ value of -19.6‰ gives a 16% marine contribution (±10%).

A regional marine offset (ΔR) of 0 ± 50 years has been used in the calibration.

Please contact the laboratory if you wish to discuss this further.

* Bronk Ramsey (2009) *Radiocarbon 51(1) pp.337-60*
† Reimer et al. (2013) *Radiocarbon 55(4) pp.1869-87*

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RADIOCARBON DATING CERTIFICATE

20 October 2020

Laboratory Code	SUERC-94922 (GU56198)
Submitter	Milena Grzybowska Archaeological Research Services Ltd. The Eco centre, Hebburn, Tyne and Wear, NE31 1SR
Site Reference	Stanton Harcourt Airfield
Context Reference	SK13
Sample Reference	SHMR18/03
Material	L ulna - proximal : human
$\delta^{13}C$ relative to VPDB	-19.6 ‰
$\delta^{15}N$ relative to air	9.8 ‰
C/N ratio (Molar)	3.3
Radiocarbon Age BP	1238 ± 29

N.B. The above ^{14}C age is quoted in conventional years BP (before 1950 AD) and requires calibration to the calendar timescale. The error, expressed at the one sigma level of confidence, includes components from the counting statistics on the sample, modern reference standard and blank and the random machine error.

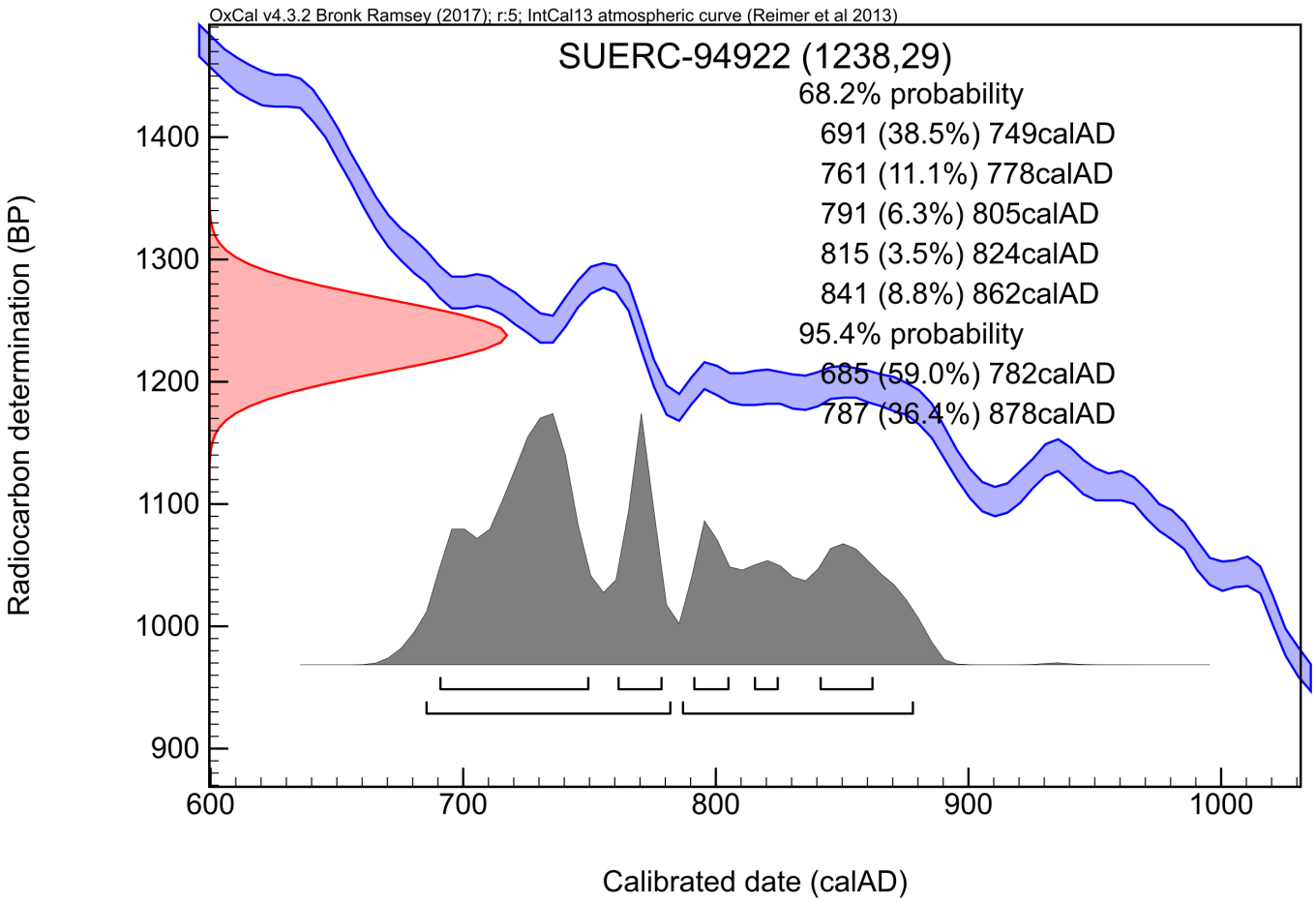
Samples with a SUERC coding are measured at the Scottish Universities Environmental Research Centre AMS Laboratory and should be quoted as such in any reports within the scientific literature. The laboratory GU coding should also be given in parentheses after the SUERC code.

Detailed descriptions of the methods employed by the SUERC Radiocarbon Laboratory can be found in Dunbar et al. (2016) *Radiocarbon 58(1) pp.9-23.*

For any queries relating to this certificate, the laboratory can be contacted at suerc-c14lab@glasgow.ac.uk.

Conventional age and calibration age ranges calculated by : E. Dunbar

Checked and signed off by :



The radiocarbon age given overleaf is calibrated to the calendar timescale using the Oxford Radiocarbon Accelerator Unit calibration program OxCal 4.*

The above date ranges have been calibrated using the IntCal13 atmospheric calibration curve†

Please contact the laboratory if you wish to discuss this further.

* Bronk Ramsey (2009) *Radiocarbon 51(1) pp.337-60*

† Reimer et al. (2013) *Radiocarbon 55(4) pp.1869-87*

Stanton Harcourt

Flint and Worked Stone

Ann Clarke

December 2019

The worked flint assemblage comprises 372 pieces including cores, retouched tools, flakes and blades (Table 1, Figure 1). The majority of the flint assemblage (80%), together with a fine spherical hammerstone, came from two Late Neolithic pits 6011 and 6109. The rest of the worked flint was redeposited in the later contexts across the site.

Raw material

The great majority of the flint is of good quality chalk flint which would have been available locally. A rough scraper (1116, SF4) which was made from a dark black flint with a smooth brown pebble cortex is the only clear instance of the use of non-chalk flint.

The flint is patinated at various stages from a light patina to matt white and this range of surface alteration is seen on the flint in most contexts. Only occasional instances of heat damage were noted and there were no concentrations of burnt flint in any of the layers.

Manufacture

The majority of the assemblage derives from Late Neolithic and Early Bronze Age flint working. Flakes dominated the assemblage (55%) and blades (12%) (Figure 1). A mix of platform types were present on the flakes including both narrow and deep flat platforms and dihedral platforms, the latter indicative of flaking from multi-platform cores. Evidence for controlled Levallois-like flaking is shown by the presence of some faceted platforms as well as some large flakes (6191.1) and thick rectangular flakes which are products of this core working (6192.2; 6199.3).

A large thinning flake (6013.9) indicates the reduction and shaping of a large, possibly bifacial piece.

The flakes range in length from 10mm to 74mm (Figure 2) and the six largest flakes form an outlying group partly composed of the thinning flake (6013.9) and Levallois-like flakes (6191.1-3; 6199.2-3).

In contrast to the flakes, the blades were all struck from flat platforms, both deep and narrow. The blades range in length between 19mm to 70mm and, like the flakes there is a small group of larger blades around >50mm in length (Figure 3).

There are no disc or Levallois-like cores present; four of the five cores that were recovered are small, or else fragments of, multi-platform flake cores (3146.1; 6013.33; 6192.12 and 6192.13) whilst (6013.8) is an elongated multi-platform core manufactured on a thick flake. Elements of core preparation are shown by a few core trimming flakes to remove step fractures on the core face (6199.3-4). On 6199.7 the step fractures were caused by a crystalline flaw. A core trimming flake (2017.2) was side-shot across the face of the core.

A number of small flakes (<10mm in maximum dimension) were recovered from sample sieving and these indicate that flint knapping was carried out in the locality.

Retouched tools

Blades and flakes were selected for further shaping into a range of tools. The group of nineteen retouched tools included, a strike-a-light, seven serrated blades, two knives and a knife/scraper, four scrapers, three edge retouched pieces, and one miscellaneous tool.

The strike-a-light (6013.18, photo 1) is clearly a well-used tool. Frequent handling and, possibly being wrapped in leather or carried in a leather pouch, has softened and rounded the original flaking scars and the whole tool is patinated to a cream colour. The bifacially flaked tapering rod is squared at the base with slight damage and is slightly squared at the striking end. The long sides have rough bifacial flaking damage from use as a strike-a-light.

The serrated blades range widely in size and shape from robust broad blades (6190.4. photo 3) to narrower, thinner forms (6191.17 Photo 3) and three of the largest blades are serrated (Fig 3, photo 2). They all have groups of fine serrations made down one or both sides of the blade which are on average about 8 teeth per 10mm. On the whole the edges are worn from use and the teeth often rounded or snapped. Silica gloss was visible on one blade.

Five scrapers include two fine end scrapers (6110.2, 6190.8 photo 3) made on large broad flakes with faceted platforms. As well as a steep scraper distal end they have long edges with continuing edge retouch down part of the length. A fine scraper is made on a shallow broad flake and is snapped across the proximal end (3093.1). A much coarser end scraper (6021.4 Photo 2) is made on a thick secondary flake and has a rough scraper edge on the broad distal end, damaged by recent breakage. Scraper (1116 SF4) is made on a primary flake of black pebble flint and has an irregular scraper edge worked around the perimeter of the flake subsequently truncated by breakage. This is likely to date to the Bronze Age.

The combined Knife/scraper tool (6110.3, photo 3) is a distal fragment of a large broad flake with a steep scraper edge and truncated edges with more acute retouch indicating a probable combined tool.

One knife is a segment of a broad blade (1147.1) which has blunting edge retouch down one side and acute edge retouch down the opposite edge, both ends truncated by breakage. The other knife form (6014.3) is less well shaped. It is made on a broad blade with a narrow flat platform and bears lengths of abrupt edge retouch on one side towards proximal end and on the same side but from the ventral face towards the broken distal end.

A broad flake (1052.1) bears semi-invasive acute flaking around one corner of the distal end. Abrupt edge retouch was present on a small section of a damaged flake (3080.5). A broad rectangular flake (3080.1) with deep flat platform had irregular continuous edge retouch or edge damage down the length of one side on the ventral face.

Hammerstone

The spherical hammerstone (6192.37 photo 4) is made from a medium-grained sandstone and the irregular pits on the surface were created by larger inclusions weathering out. The stone was most likely available locally. Its surface has been pecked all over to an almost spherical

form and there is no trace of cobble cortex to indicate the origin of the blank. It is an almost symmetrical form, measuring 65mm in diameter around most of the surface. There are also areas of slight flattening of the surface where there has been concentrated pecking. Given the symmetrical form it is likely that this ball was shaped to a sphere prior to use and the flattened areas were caused by working the tool.

The careful shaping may have been to intentionally roughen the surface and form it into a curved profile to avoid irregular or protruding edges. This would imply a specific use – probably crushing, pulverising or flattening. There is no evidence for ground surfaces on the tool so it was unlikely to have been used as a rubber or grinder. Perhaps it was used along with the serrated blades in the same process of preparing plant fibres for cord making; the spherical hammerstone would be used to flatten the stalks carefully and avoiding cutting the length of the fibres in preparation for the blades to shred the plant materials. It would be interesting to test this assertion by recording the association of serrated blades with other stone tools.

Distribution and context

The majority of the worked flint (80%) was concentrated in the two pits 6011 and 6019. Only eight other flints were found in Area 6 (Table 2) and of these five were just small flakes from Posthole 6017. The remainder of the worked flint was also scattered across the rest of the site redeposited in the later ditches, graves and pits of Areas 1, 2 and 3 (Table 2). These share the same Late Neolithic manufacturing characteristics of the flint from the two pits: broad flakes and blades; dihedral platforms; multi-platform core; and a scraper and serrated blade. This shows that an occupation of this Late Neolithic date occurred at least across the extent of the opened trenches. A small assemblage from Pit 1147 comprised Late Neolithic flint work including knife fragment 1147.1. This pit was dated to LIA/ERO but it might be an earlier prehistoric pit similar to the two pits in Area 6.

There was no evidence for earlier or later flint working on site with the exception of one rough scraper (1116 SF4 Ditch 1501) made from a primary flake of pebble flint which is likely to date to later Bronze Age activity.

<u>Late Neolithic Pits 6011 and 6109 (Table 2)</u>

The assemblages from the two pits were similar in character with classic elements of Late Neolithic flint working: broad robust flakes; dihedral and faceted platforms; multi-platform cores, thinning flakes; and serrated blades, scrapers and knives. The main difference between pits is in the assemblage sizes - Pit 6109 had larger numbers of flint (189 pieces) compared to Pit 6011 (106 pieces). There are more subtle differences in the composition of the assemblages with 6109 having a larger component of small flakes and a lower ratio of flakes to blades whilst 6011 had a greater proportion of flakes to blades and a larger component of retouched tools (Figure 4). Within the pits there are slight differences between the layers e.g. in pit 6109 (6192) had flakes from the stages of initial core reduction as well as core fragments and trimming flakes whereas in (6199) there were more finished blanks.

Worked flint was concentrated in the basal layers of both pits and in both of the recuts (Table 2). Deposition appears to have taken place in short episodes with the flints apparently selected to represent the various stages of manufacture and use; from nodule reduction, and thinning to

retouched tools as well as utilised tools. Given the range of knapping techniques represented, this selection would have been taken from several episodes of flint working. The worked flint in the recuts was no different in character to that in the original fills which would suggest there was little time between the recut and its refilling. The flint could have originally been incorporated into the final fills of the pit and then displaced by recutting, perhaps for the insertion of a post marker; its removal within a short time would then have allowed the recut to refill with the original flint work. Alternatively the recut was filled in the same manner as the earlier fills suggesting again a short spell between opening and closing the cut.

The selection of retouched tools is interesting: it is dominated by serrated blades and scrapers and there is a finely made and well-handled strike-a-light as well as the spherical hammerstone. They had all been used, their working edges worn and broken and they must have been collected from the areas where they had been part of a range of processing activities and brought to the pits to be buried.

Background

A considerable amount of research has been carried out on Neolithic and Early Bronze Age pits and their contents in recent years (Thomas and Anderson-Whymark 2012) and in the Solent Thames Research Framework for Neolithic and Bronze Age Oxfordshire an important aspect of research is discovering how the pit deposits relate to domestic activity and whether they represent material in everyday use (STRF haven't got an author or date for this). Research on pits in the Upper Thames Valley (Anderson-Whymark 2012) indicates that the period between cutting and filling the pit is relatively brief, and that Late Neolithic pits can have up to five fills. The fragmentary and abraded nature of the finds suggested that they were incorporated into the pit from middened deposits. They also had high proportions of retouched tools (10% - 20%). It was also noted here that serrated flakes dominated some Early Neolithic assemblages and scrapers dominated Late Neolithic/Early Bronze Age (ibid, 190). The pits at Stanton Harcourt share many of these characteristics though the flints appear to have been more closely selected for inclusion and more representative of a range of actions than simply being acquired from redeposited rubbish contexts. At Stanton Harcourt serrated blades and scrapers occurred closely together in a number of contexts and could be presumed to be contemporary.

At nearby Gravelly Guy the pits are round-based and heavily truncated and probably date to the Early Bronze Age. There were few immediate similarities with the flint at Stanton Harcourt and there were no serrated blades thought there was a strike-a-light (referred to as a fabricator in the text) in pit 3038 (Lambrick and Allen 2004). A flint strike-a-light of very similar dimensions to the one from Stanton Harcourt (6013.18) was found with the primary cremation burial at Stanton Harcourt Barrow 4 (Harden and Treweeks 1940).

References

Anderson-Whymark, H & Thomas, J (eds) 2012, *Regional Perspectives on Pit Deposition: Beyond the Mundane*. Vol. Neolithic Studies Group Seminar Paper 12

Anderson-Whymark, H 2012 Neolithic to Bronze Age pit deposition practices and the temporality of the occupation in the Upper Thames Valley i*n* H Anderson-Whymark & J Thomas (Eds) 2012, *Regional Perspectives on Pit Deposition: Beyond the Mundane*. Vol. Neolithic Studies Group Seminar Paper 12, 187-99

Harden, DB and Treweeks, RC 1945 'Excavations at Stanton Harcourt, Oxon, 1940' *Oxoniensia* 10, 16-42

Lambrick, G and Allen, T 2004 *Gravelly Guy, Stanton Harcourt, Oxfordshire: the development of a Prehistoric and Romano-British community*. Thames Valley Landscapes Monographs No. 21, Oxford Archaeology

Flakes	203
Blades	45
Retouched tools	19
Cores	5
Spalls and chunks	6
Small flakes (<10mm maximum dimension)	94
Total Flint	**372**
Stone Tools	1

Table 1: Worked flint and stone tools

Feature	Flake	Blade	Small flakes	Retouched tools	Spall and chunk	Core	Total
Ditch 1500		1		Serrated blade			2
Ditch 1501	1			Scraper; Invasive flaking			3
Ditch 2500	5	1					6
Ditch 3144		1			1	1	3
Ditch 4007		1					1
Ditch 6120	1						1
Grave 3040	1						1
Grave 3058			6				6
Grave 3068	1						1
Grave 3070			1				1
Grave 3078	1						1
Grave 3151			3				3
Gully 61		1					1
Pit 1146	2	2		Knife			5
Pit 1153	1						1
Pit 2078		2	4		1		7
Ring Ditch 3500-6	11	5	3	Scraper; Edge retouched x 2			22
PH 6017	1		5				6
Gully 6118		2					2
16/12	1						1
TS	1						1
Total	**27**	**16**	**22**	**7**	**2**	**1**	**75**

Table 2: Worked flint from Post-Neolithic features

Pit	Fill	Flake	Blade	Small flakes	Retouched tools	Spall	Core	Total flint	Other stone
6011	6012			1				1	

	6013	51	4	7	Serrated blade x 3; Strike-a-light	2	2	70	
	6014	12	2	5	Serrated blade; Knife form			21	
	6022			1				1	
6020 recut in 6011	6021	5	1	6	Scraper			13	
6109	6190	16	4		Serrated blade; Scraper	1		23	Unused Cobble
	6191	21	1	7	Serrated blade	1		31	
	6192	28	13	12			2	55	Spherical hammer-stone
	6199	31	3	33				67	
6202 Recut in 6109	6110	6	1		Scraper; Knife/scraper			9	
	6124	4						4	
Unstratified prehistoric pit		2						2	
Total		**176**	**29**	**72**	**12**	**4**	**4**	**297**	

Table 3: Prehistoric pits with flints

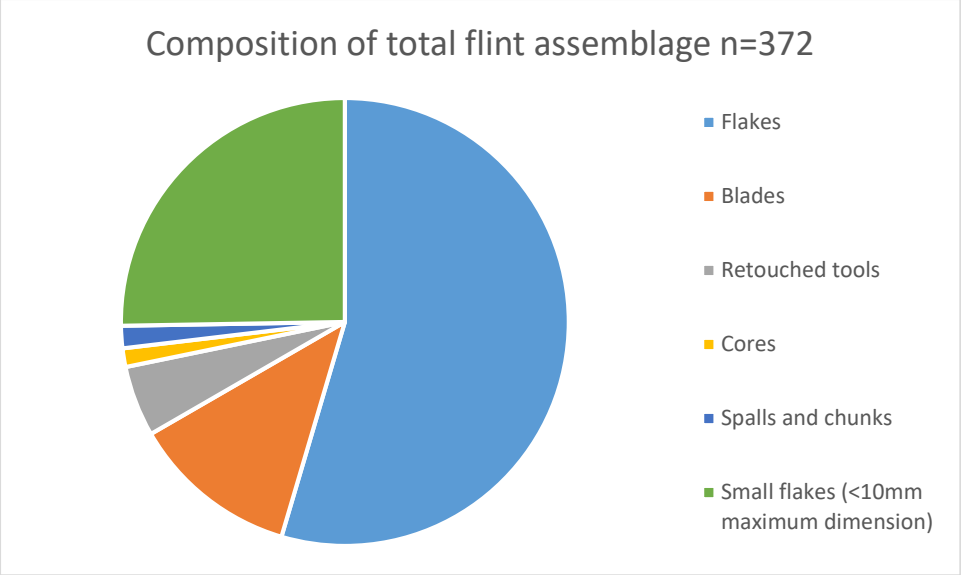


Figure 1: Composition of total flint assemblage

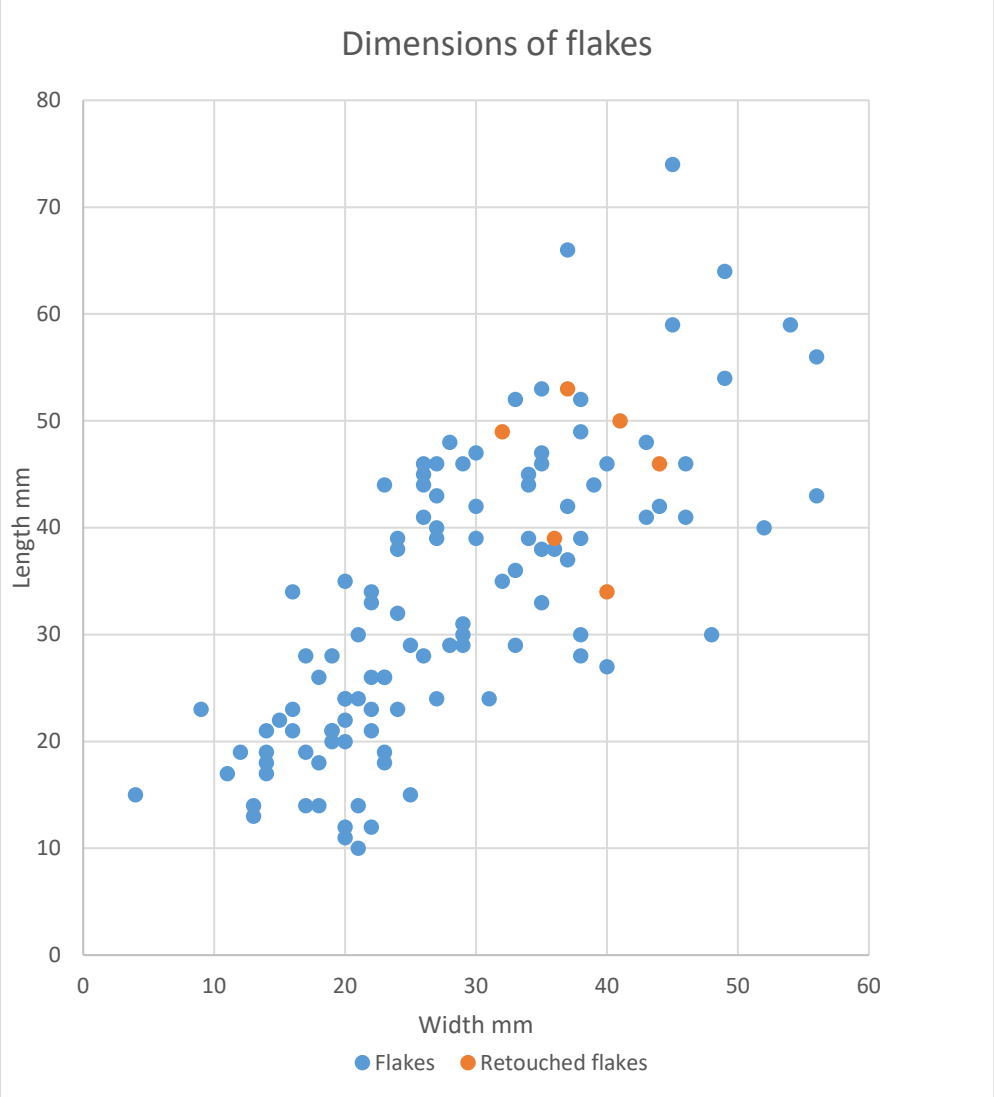


Figure 2: Dimensions of flakes and retouched flakes

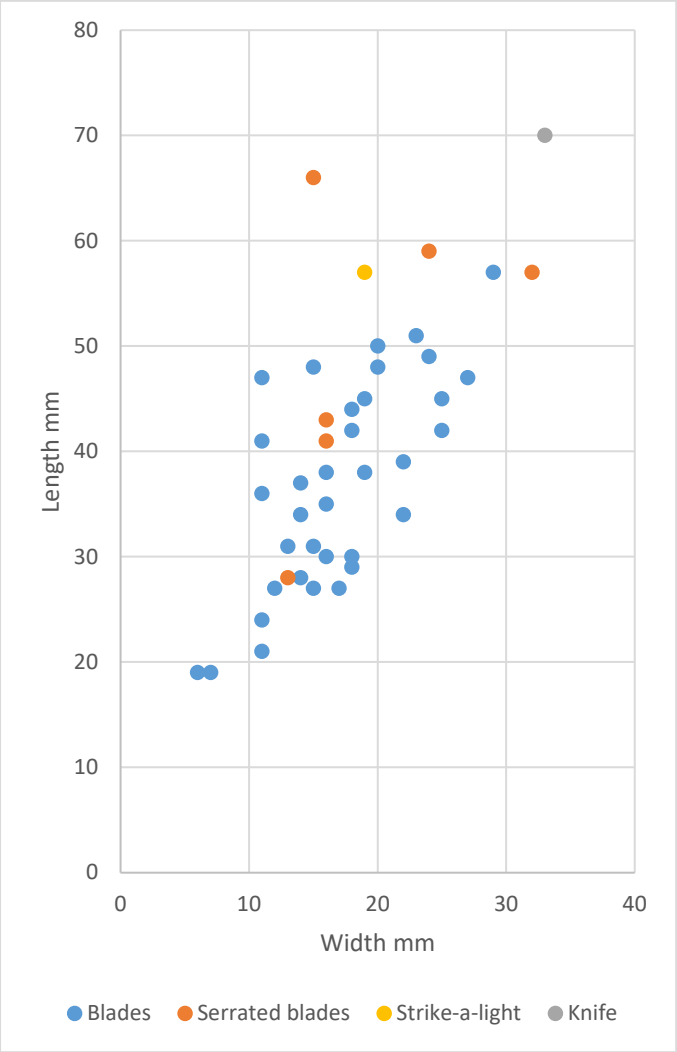


Figure 3: Dimensions of blades and retouched blades

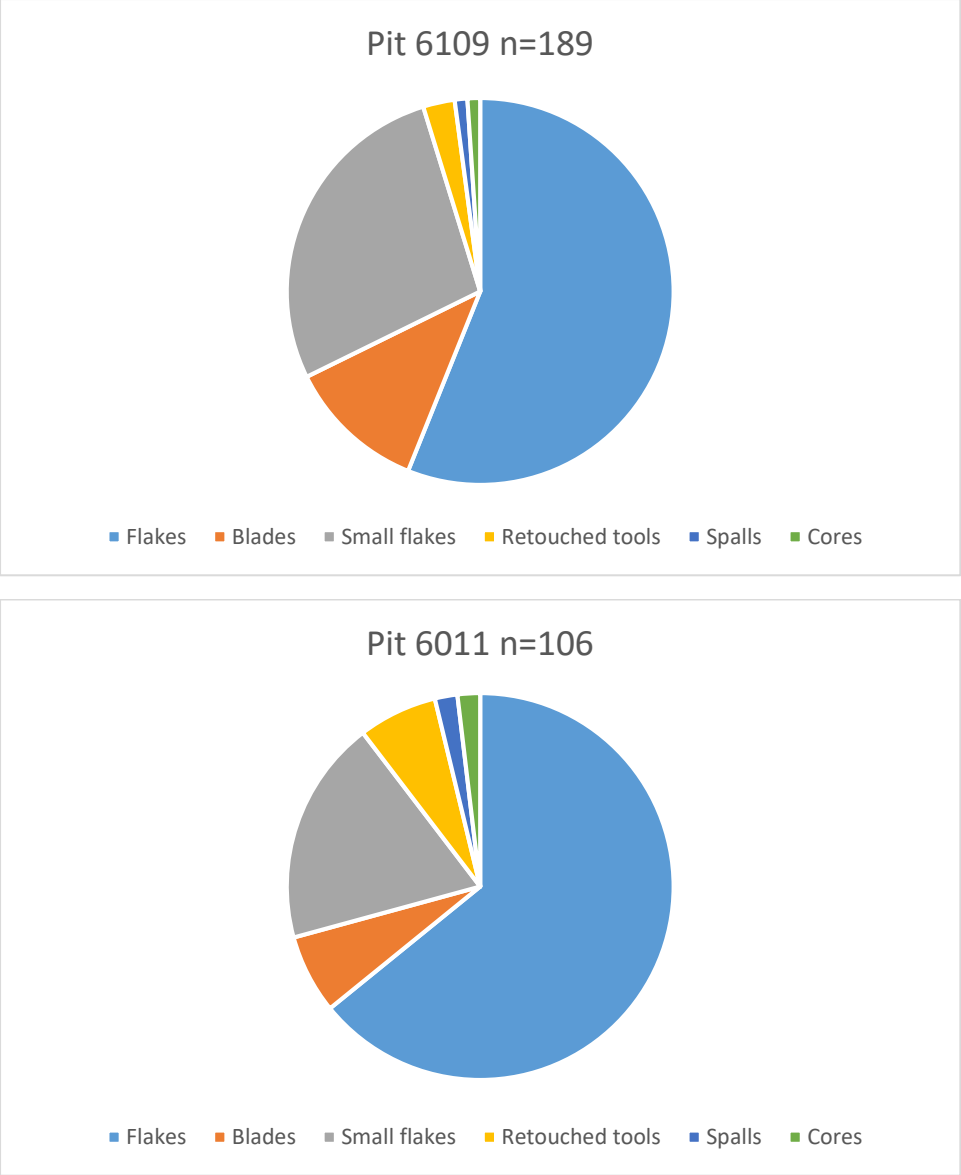


Figure 4: Proportion of worked flint in Late Neolithic pits 6011 and 6109

Photo 1: Strike-a-light 6013.18

Photo 2: Retouched tools from Pit 6011. Top row Serrated blades 6013.3; 6013.17; 6013.1; Strike-a-light 6013.18. Bottom row Knife form 6014.3; Serrated blade 6014.2; Scraper 6021.4

Photo 3: Retouched tools from Pit 6109. Top row Serrated blades 6190.4; 6191.17. Bottom row Scrapers 6190.8; 6110.2; Knife/scraper 6110.3.

Photo 4: Spherical hammerstone (6192.37)

THE ANIMAL BONES FROM PREHISTORIC AND ROMANO-BRITISH DEPOSITS AT STANTON HARCOURT AIRFIELD, MAIN ROAD, STANTON HARCOURT, OXFORDHIRE

Claire Ingrem *October 2019*

A significant quantity of animal bone was recovered from Stanton Harcourt Airfield, Main Road, Stanton Harcourt, Oxfordshire during a watching brief and excavations by John Moore Heritage Services. These investigations revealed deposits spanning the Neolithic to Romano-British periods although the majority of the animal bone came from a Bronze Age ring ditch and Romano-British pits and ditches.

Methodology

Anatomical elements were identified to species where possible with the exception of ribs and vertebrae which were assigned to animal size categories. Mandibles and limb bones were recorded using the zonal method developed by Serjeantson (1996) to allow the calculation of the minimum number of elements (MNE) and individuals (MNI); this is based on the most numerous zone of a single element taking into account side. In addition, all bone fragments over 10 mm in the hand recorded material and over 2 mm in the sieved samples were recorded to species or size category to produce a basic fragment count of the Number of Identified Specimens (NISP). Fragments categorised as large mammal are likely to belong to horse or cattle, those in the medium mammal category to sheep/goat or pig.

The presence of gnawing and butchery together with the agent responsible was recorded. Evidence for burning was also noted but should be treated with caution as bones can become stained black and brown by other process such as waterlogging (Lyman 1994).

Measurements were taken according to the conventions of von den Driesch (1976) and Cohen and Serjeantson (1996) for birds. **Withers height of cattle was estimated using the factors (combined for cows and steers) of Matolcsi (in von den Driesch and Boessneck 1974, 336) and of sheep using the factors of Teichert (ibid.).** The wear stages of the lower cheek teeth of cattle, caprines and pig were recorded using the method proposed by Grant (1982) and age attributed according to the method devised by Payne (1973), Legge (1982) and O'Connor (1988). The fusion stage of post-cranial bones was recorded and age ranges estimated according to Getty (1975). Measurements of the crown height of horse teeth were recorded and age estimated according to the method of Levine (1982).

A selected suite of elements was used to differentiate between sheep and goat (Boessneck 1969; Payne 1985): the distal humerus, proximal radius, distal metapodials, astragalus, calcaneus and deciduous fourth premolar. No elements were positively identified to goat so for the purposes of this report the caprine remains are referred to as sheep.

Condition of the bone and taphonomy

In order to estimate the potential of an assemblage to provide taphonomic information, the condition of the bone is graded on a scale of 1 to 5. That assigned to '1' is deemed to be in excellent condition, demonstrating little post-depositional damage whilst bone material classed as '5' has suffered severe surface erosion and can be identified only as 'bone'. The condition of the bone recovered by hand from Stanton Harcourt is given in Table 1 and this indicates that almost half of the assemblage is in poor condition (Grade 4). The material categorised as 'poor' includes almost all the specimens recovered from Neolithic and Bronze

Age deposits whilst the Romano-British material is in moderate (Grade 3) or good (Grade 2) condition.

The poor condition of the Neolithic and Bronze Age remains indicates that, compared with the Roman assemblage, they have suffered a higher rate of damage and destruction. The survival of bone is generally density dependent and consequently species and anatomical representation will almost certainly have been biased as a result of the taphonomic processes that seek to destroy bone. In particular, the bones of smaller animals such as sheep and pig are less likely to survive than those derived from larger animals such as horse and cattle. Porous juvenile bones are also likely to have suffered from preferential destruction. In contrast, bones that are comprised of dense cortical bone such as limb shafts are more likely to survive than those comprised of cancellous bone as is the case for the articular ends of limb bones, ribs and vertebrae.

Data

A total of 940 specimens were recovered by hand collection of which 26% are identifiable (Table 2i). The majority (n=177) of the identifiable assemblage came from Romano-British deposits with small amounts derived from Neolithic and Bronze Age contexts.

A further 1,005specimens came from the sieved samples (Table 2ii) but only a very small proportion (2%) are identifiable. In addition to the taxa represented in the hand collected assemblage, vole and other rodent remains are present which probably represent natural casualties so will not be discussed further.

Neolithic/Early Bronze Age

All the Neolithic/Early Bronze Age specimens were recovered from two pits (6011, 6109) in Area 3 during the watching brief. Most of the material derives from the fill of Pit 6011 (context 6013) including 17 cattle bones (Table 3). Scapulae are the most numerous element representing at least 2 individuals but despite the small size of the sample most parts of the body (head, fore-limbs, hind- limbs and feet) are represented (Table 4). In addition, a humerus, an ulna and a femur belong to pig and a metatarsal to a red deer *(Cervus elaphus*). The upper fill of Pit 6011 (context 6014) produced a pig upper premolar.

Pit 6109 produced just six specimens that are identifiable to species and five of these belong to cattle including two fragments of scapula and two pieces of radius that came from context 6192 and represent a minimum of one individual. Another fill (context 6191) produced a cattle humerus and a pig incisor (Table 4).

Overall, the presence of at least 3 cattle right humerii indicates that a minimum of 3 cows/steers are represented.

Ageing data is scarce but a cattle deciduous fourth premolar at wear stage ‘j’ (Table 8) and an unfused cattle distal metapodial suggest at least one cow/steer died before reaching 30 months although .

Butchery marks are present on two cattle bones. A left scapula has an oblique chop on the medial side of the blade and an oblique cut mark is preserved on an astragalus.

Fifteen specimens from the sieved samples are burnt (calcined and charred) but all are unidentifiable.

Bronze Age
Forty-six identifiable fragments were recovered by hand from various contexts associated with the Bronze Age ring ditch during excavations in Area 3 (Table 2i) and sieved samples produced a sheep bone (Table 2ii). Almost half the specimens belong to cattle and large mammal although horse, sheep, pig and dog are all represented (Table 2i). The samples recovered from individual contexts are all small with the largest (context 3007) comprised of 18 specimens (Table 5). Cattle are the most numerous of the major domestic animals (cattle, sheep, pig) but this may well be a function of the small sample size and the preferential destruction of bones belonging to smaller animals.

Cattle are again represented by elements from most parts of the body (Table 6) with minimum of 3 individuals indicated by femora (Table 71). The presence of sheep teeth, fore-limbs, hind-limbs and feet also indicate that at least one entire sheep carcass was originally present (Table 7ii). In contrast, pig is represented solely by a mandible and isolated upper and lower teeth conceivably from the same skull (Table 7iii).

Five horse bones including a humerus, radius, pelvis and two 1st phalanges were spread across four contexts (3007, 3082, 3094, 3123). A mandible belonging to a dog similar in size to a modern day Labrador was recovered from context 3118.

Ageing data is again scarce but isolated teeth indicate that one cow/steer died between the ages of 6-8 years and a sheep between 3-4 years whilst one pig was sub-adult.

A single specimen preserves evidence for canid gnawing (Table 10i).

Romano-British
A total of 389 fragments were recovered by hand from Romano-British deposits with a further eight derived from the sieved samples. The assemblage is dominated by cattle (n=142) remains which according to NISP are almost twice as numerous as sheep whilst pig is relatively scarce (Table 2). Horse (n=23) is fairly well represented being more numerous than pig. A few (n=6) dog bones were recovered and one specimen, a tibia belongs to a cat. Red deer are represented by a scapula. A human foetal/neonatal femur and a fragment of a human phalanx are also present.

The calculation of MNE and MNI contradicts the NISP data and indicates that at least 3 cattle and six sheep were originally present (Table 7).

Horse, cattle and sheep are represented by elements from most parts of the body – head, major fore-limbs, hind limbs and feet (Tables 6i, ii, & iii). The small pig assemblage is comprised solely of head (canine, incisor, maxilla and mandible) and foot (1st phalanx) bones. Dog is represented by two mandibles which derive from an animal the size of a modern day Labrador, a canine, a lower premolar, a humerus, radius and a femur.

Dental data is scarce (Table 8) but indicates that one cow/steer died when aged between 3-6 years. The majority of sheep were culled between 2-4 years although there is evidence for the deaths of one younger (6-12 months) and one older animal (4-6 years). One pig died whilst sub-adult. Three specimens provide ageing data for horse and all belong to animals aged between 9 and 12 years. A larger sample of epiphyseal fusion data is available for cattle and this indicates that most cattle survived past 4 years (Table 9).

Evidence for gnawing by canids is preserved on 28 specimens, particularly those belonging to cattle although horse, sheep and red deer are also affected (Table 10). Eight specimens display butchery marks in the form of cut and chop marks and all belong to cattle and large mammal (Table 11). A few specimens have been burnt and are either calcined or charred (Table 12).

Metrical data is given in the appendix and where possible has been compared with that held on the Animal Bone Metrical Archive Project (ABMAP) database and all are within the range of measurements recorded at contemporary sites.

Two bones are able to provide an estimate of withers height, A metatarsal indicates that one horse was 1.4 metres high at the shoulders. A cattle radius belonged to a cow/steer with a withers height of approximately 1.14 metres.

Discussion and interpretation

Neolithic and Bronze Age

The Neolithic/Early Bronze Age assemblage recovered from Area 3 during the watching brief is too small to be able to provide reliable information concerning animal husbandry practices. It is only possible to be certain that cattle, pig and red deer were exploited during this period and that at least one cow/steer was immature. However, the fact that most parts of the cattle skeleton are represented strongly suggests that cattle arrived on the hoof. Calculation of the minimum number of individuals indicates that at least three cows/steers are represented which when combined with the generally poor condition of the bones, provides an insight into the degree of taphonomic destruction that the bone material has been subjected to since initial deposition.

The Bronze Age assemblage is slightly larger but is still insufficient in size to withstand detailed analysis and supplement existing knowledge. However, horse, cattle, sheep, pig and dog were all present at the site and body part representation once again suggests that animals, particularly horse, cattle and sheep, arrived at the site on the hoof. Once again, the effects of taphonomy are clearly illustrated by the poor condition and the minimum number of cattle represented. Evidence for adult cattle and sheep suggests that not all animals were kept solely to provide prime meat and that secondary products were also valued.

Previous excavations at Stanton Harcourt produced small Neolithic and Bronze Age animal bone assemblages. At Gravelly Guy, the Late Neolithic/ Early Bronze Age assemblage consisted of just over 70 identifiable specimens and cattle were the most numerous taxa followed by pig with sheep/goat and red deer also present (Mulville *et al*, 2004:465). According to Mulville *et al (ibid*), the species present are characteristic of late Neolithic southern Britain and the high proportions of cattle and pig similar to those recorded at contemporary sites. A smaller assemblage was recovered from Beaker to Middle Bronze Age deposits (Layer G) in the henge enclosure ditch at Devil's Quoits but as with the assemblage from Stanton Harcourt Airfield, much of the material was poorly preserved and unidentifiable (Levitan, 1995:56,57) rendering interpretations tentative. That said, the unusually high frequency of cattle (90%) and red deer antler led Levitan *(ibid:62)* to consider ritual activity as a possible explanation.

Romano-British

The Romano-British assemblage is larger and in better condition than the material recovered from earlier periods. However, the sample is still fairly small so interpretations should be treated with caution. Many contemporary rural sites have produced much larger collections of animal bone and these include Gravelly Guy at Stanton Harcourt where over 4,000 identifiable fragments were recovered (Mulville *et al*, 2004) and Uffington White Horse hillfort (Ingrem, 2003).

The relative proportions of domestic animals found at Romano-British sites is generally thought to reflect the degree of Romanisation and at many villa and urban sites the proportions of cattle and pig appear to increase at the expense of sheep/goat (King 1978, 1992). Investigations by Hamshaw-Thomas (2000) suggest that the shift from sheep to cattle reflects a general economic intensification caused by social rather than cultural change.

At Stanton Harcourt airfield, sheep were probably kept in greater numbers than cattle during the Romano-British period. The discrepancy that exists between the NISP and MNI data is a probable reflection of the small sample size and variations in the density and fragility of bones resulting in the preferential destruction of bones belonging to smaller animals such as sheep. The assemblage from Gravelly Guy lends support for this suggestion since sheep/goat are the most numerous taxa according to fragment counts. Sheep were the most common species at many other contemporary rural settlements in southern Britain including Uffington White Horse Hill, Oxfordshire (Ingrem, 2003) and Owslebury, Hampshire (Maltby 1987: 335) although as at the two Stanton Harcourt sites, it is likely that beef was eaten more often than mutton as a result of the smaller size of sheep compared with cattle.

Body part representation indicates that horses, cattle and sheep continued to arrive at the site on the hoof which is unsurprising for a site of this period and was also apparent at Gravelly Guy and Uffington White Horse Hill. This was probably also the case for pigs despite the fact that only head and foot bones were recovered since this might result from differential deposition whereby more meaty parts were deposited elsewhere.

There is some evidence to suggest that the majority of cattle survived into adulthood but in the absence of more reliable data from tooth eruption and wear this should be treated with caution. At Gravelly Guy (Mulville *et al,* 2004) there is evidence for two peaks in slaughter – at around 8 months and as adults/old adults which were thought to represent the continued mixed use of cattle and tighter regulation of meat production (Mulville *et al*, 2004). In general, small rural settlements including Balksbury (Maltby 1981: 180) and Winnal Down (Maltby 1985: 110) tend to produce higher proportions of immature cattle than urban settlements (Maltby 1982: 179-182) where the focus on mature animals is thought to reflect the increasing importance of secondary products (traction, milk, manure, blood), particularly the use of cattle for traction in order to intensify agricultural production.

Sheep on the other hand appear to have been slaughtered before they reached four years of age which suggests they were kept primarily for meat; by this age however, they would have produced several fleeces and so it appears that secondary products (wool, manure, milk) were also valued. Evidence for the presence of an animal (6-12 months) suggests that sheep were raised at the settlement although there is no evidence for new born lambs. At Gravelly Guy, evidence for a major peak in slaughter between 6-12 months and a marked kill off between 2-3 years similarly suggested a focus on meat production (Mulville *et al*, 2004). This conforms with the general pattern of sheep mortality during the Romano-British period whereby sheep were primarily exploited for meat (Maltby 1981) and is similarly seen at Uffington White

Horse Hill (Ingrem ,2003) where a considerable proportion of the sheep were slaughter whilst immature.

Pigs are generally found in small numbers (Maltby n.d) and since they provide little in the way of secondary products are generally slaughtered when sub-adult, once they have reached their optimum meat weight. Evidence for this type of culling strategy is available from numerous contemporary settlements, both urban (Ingrem, 2012) and rural (Ingrem, 2003). It is worth noting that as well as being efficient producers of first class protein, pigs can play an important role in cereal cultivation by turning over the soil in their search for roots.

Horse remains are commonly found at Romano-British sites but only in small numbers. Their relatively high frequency here at Stanton Harcourt airfield (10%) conforms to the relatively high incidence recorded at Gravelly Guy (6%). At the latter, the evidence indicates they were relatively more numerous in the early enclosures than in later deposits suggesting to Mulville et al (2004: 468) continuity with the Middle Iron Age period and a decline in interest and/or the consumption of horses during the Late Iron Age/Early Roman period. A predominance of adult horses is usual although at Gravelly Guy, there is also evidence for immature and very young horses indicating that horses were being raised at the site *(ibid*:472) whilst the burial of older horses suggests that some, at least, were kept for use by the inhabitants.

Dogs are also commonly found at Romano-British sites and may have been kept as pets, for guarding or for hunting although it is equally possible that their remains represent feral dogs living in the vicinity of human habitation sites in order to take advantage of the rich picking son offer. A similar proportion of dog remains were recovered from Gravelly Guy where there is also evidence for both butchery and burials.

Cat was recovered from Middle Iron Age deposits at Gravelly Guy so is not unexpected in the Romano-British deposits from the airfield..

The remains of wild animals are generally scarce at contemporary sites although red deer are often present in small numbers as was the case at both Stanton Harcourt airfield and Gravelly Guy. King (1978; 207-232) notes that at sites where deer are present, in the vast majority of cases they belong to red deer.

Domestic fowl would have been valued for meat, eggs and feathers and are also often present in small numbers at contemporary sites including Uffington White Horse Hill.

Summary

The prehistoric and Romano-British animal bone assemblages conform well to the pattern observed at contemporary rural sites in the region. There is evidence for the continued exploitation of domestic animals throughout the sites occupation. During the Romano-British period, cattle and sheep were the major species exploited with whole carcasses originally present. Sheep appear to have been kept primarily to provide meat at this time although secondary products would also have been available in the years before they were slaughtered. Cattle appear to have been kept primarily to provide secondary products. Horses were relatively numerous but there is no evidence to suggest they were bred at the site.

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