

**SILBURY HILL, WILTSHIRE**  
**THE ANIMAL BONE ASSEMBLAGE EXCAVATED**  
**FROM SILBURY HILL IN 2007-8**

**ENVIRONMENTAL STUDIES REPORT**

Fay Worley



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**Silbury Hill  
Wiltshire**

**The animal bone assemblage excavated from Silbury Hill  
in 2007-8**

Fay Worley

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## SUMMARY

A small assemblage of animal bone was recovered from remedial works during the Silbury Hill Conservation Project. A small number of cattle, pig/wild boar and micro-faunal bones were recovered from the earliest phases of the hill's construction and the old land surface below its centre. With the exception of red deer antler fragments (Worley 2011, Worley forthcoming) and two fossil shark teeth, no vertebrate remains were recovered from the tunnel as it passed through the chalk. A much larger bone assemblage was recovered from a trench excavated on the hill's summit. This assemblage contained a variety of wild and domestic species and predominantly represents Medieval and later activity, although some bones may be derived from earlier contexts and there is also evidence of intrusive material. This report is summarised in the Excavation Monograph (Leary *et al* forthcoming).

The cover image shows a live common frog (*Rana temporaria*) photographed in a small void in the hill during the excavation (Photo: English Heritage).

## CONTRIBUTORS

Rebecca Nicholson (fish bone identification).

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## CONTENTS

Introduction .....	1
Methods .....	1
Phasing.....	2
Results and Discussion .....	2
Animal bones from the tunnel excavations.....	2
Phase 2: Old land surface .....	2
Phase 4: Lower organic mound.....	3
Phase 5: Pitting activity.....	3
Phase 6: Upper organic mound.....	3
Phase 20.2: 20 <sup>th</sup> /21 <sup>st</sup> Century activity.....	3
Animal bones from previous excavations in the tunnel .....	4
Animal bones from summit excavations .....	4
The badger bones.....	7
The anuran bones.....	8
Animal bones from previous excavations on the summit.....	8
Conclusions .....	8
Appendix 1- Taxa identified in the summit excavation assemblages.....	9
Phase 16.2: Final mound construction.....	9
Phase 17: Medieval activity.....	10
Phase 18: 1776 shaft and 18 <sup>th</sup> century tree planting.....	12
Phase 20.1: 20 <sup>th</sup> century activity.....	13
Phase 20.2: 1968-70 excavations .....	14
Unstratified bones.....	14
List of References .....	14

<i>Table 1: Recorded measurements (in mm) .....</i>	3
<i>Table 2: All recordable hand collected animal bones recovered from the summit excavation quantified by NISP and presented by phase .....</i>	5
<i>Table 3: Condition of hand collected bones (excluding teeth) from the summit, presented by phase.....</i>	6
<i>Table 4: Phase 16.2 hand collected assemblage by context.....</i>	9
<i>Table 5: Phase 16.2 bones collected from sample residues.....</i>	9
<i>Table 6: Phase 17 hand collected assemblage by context .....</i>	10
<i>Table 7: Phase 17 bones collected from sample residues .....</i>	11
<i>Table 8: Phase 18 hand collected assemblage by context .....</i>	12
<i>Table 9: Phase 18 bones collected from sample residues .....</i>	12
<i>Table 10: Phase 20.1 hand collected assemblage by context.....</i>	13
<i>Table 11: Phase 20.1 bones collected from sample residues.....</i>	13
<i>Table 12: Phase 20.2 hand collected assemblage by context.....</i>	14
<i>Table 13: Unstratified hand collected animal bones .....</i>	14
 <i>Figure 1: Butchered badger sacrum (photo: author).....</i>	7

## INTRODUCTION

Dating to the late Neolithic, Silbury Hill is the largest manmade prehistoric mound in Europe, its importance is reflected in its designation as a Scheduled Ancient Monument (NM 21707) within the area of the Stonehenge, Avebury and Associated Sites World Heritage Site. It is located in Wiltshire (NGR SU 1001 6853), sitting between West Kennet long barrow to the south and Avebury henge to the north.

This report documents animal bones recovered during remedial works at Silbury Hill in 2007-8. A version of this report will be published in Leary *et al* (forthcoming).

## METHODS

Animal bones recovered by hand and those from environmental samples were analysed separately. Hand collected bones were washed prior to analysis. All countable hand collected animal bones were identified as precisely as possible to element and species and recorded in a *Microsoft Access* database, data from which can be found with the site archive. Bones of corvid species were distinguished using Tomek and Bocheński (2000) and select anuran (frog or toad) bones were identified to species using Bailon (1999). Fish bones were separated from other vertebrate remains and analysed by Rebecca Nicholson, whose identifications are included in this report. Fully fused and suitably complete bones were measured following standard published sources (Table 3).

Serjeantson's (1996) zones were used to record mammalian and avian bones and bone fragments. Specimens were considered 'countable' if they could be identified to species and element; comprised more than 50% of any zone if an appendicular element; comprised at least 50% of zones one or two if a rib; comprised at least 50% of zones one, two, seven or eight if vertebral; or comprised at least 50% of the crown of an isolated tooth. Indeterminate fragments and fragments that did not fulfil any of these requirements were counted and recorded in a *Microsoft Excel* spreadsheet. Bones from sample residues were also recorded in a *Microsoft Excel* spreadsheet. Both spreadsheets can be found in the site archive.

The high frequency of micro-faunal (mouse/frog size; predominantly anuran) remains in many sample residues precluded individually recording each bone. Rather, the sample fractions were weighed and the average weight per litre of sample processed was calculated to provide an estimate of relative prevalence between samples. All specimens from larger taxa in each sample were counted. Within the two largest samples for each phase, the number of anuran ilia were counted to provide an estimate of the minimum number of individuals (MNI) and species represented, micro-faunal dental elements and micro-mammal (mouse size) post-cranial elements were also identified to taxon.

## PHASING

The phasing is used in this report that used in Leary, Field and Campbell (forthcoming). Natural geology and the land surface predating the construction of Silbury Hill are recorded as Phases 1 and 2. Phases 3 to 16 represent the construction of the monument and all occurred in the Late Neolithic. Phases 3 to 6 comprise the initial gravel and organic mounds; 7 to 11 are the first ditch and successive banks; 12 to 15 are infilling and backfilling of successive ditches surrounding the expanding monument, and 16 represents the final mound construction.

Phase 17 represents medieval activity on the summit (probably in the 10<sup>th</sup> or 11<sup>th</sup> centuries AD), while Phases 18 to 20 represent antiquarian and modern activity, which disturbed earlier deposits. Phase 18 includes a shaft sunk into the centre of the mound in 1776 and 18<sup>th</sup> century tree planting on the summit, Phase 19 represents the 1849 tunnelling into the hill and phase 20 represents 20<sup>th</sup> century excavations and collapse on the summit.

## RESULTS AND DISCUSSION

The animal bone assemblage was recovered from contexts dating to phases 2, 4, 5, 6, 16.2, 17, 18, 20.1 and 20.2. The vast majority of the assemblage dated to the later phases and was recovered from the hill top excavation. The following results and discussion consider the bones from the tunnel excavations and those from the summit separately.

### **Animal bones from the tunnel excavations**

The few animal bones recovered from the earliest phases of activity at Silbury Hill, are presented below. In addition, two fossil shark teeth were recovered from phase 12.1 and 12.2 fills of ditch 1, these are of geological origin and therefore excluded from further comment. No bones from the tunnel exhibited any butchery marks or pathological lesions. No conclusions can be drawn from this small sample, beyond the occurrence of species.

### **Phase 2: Old land surface**

Animal bone small finds 8041 and 8043 were from the old land surface. Small find 8041 was a pig maxillary 3<sup>rd</sup> premolar, which was slightly worn. It may be from a domestic pig or wild boar. Three further fragments of enamel were also recovered and may be from the same individual. Small find 8043 comprised 14 fragments of medium mammal sized bone, in poor condition.

#### Phase 4: Lower organic mound

A single cattle incisor enamel fragment was hand collected from the lower organic mound (4156). A further cattle bone (a fragmented left radius) was recovered from a sieved sample of the same context. The radius could not be measured, but was from quite a large, robust individual. Its age-at-death is unknown.

#### Phase 5: Pitting activity

A few scraps of indeterminate bone, an anuran bone and a micro-mammal incisor were recovered from samples of contexts 3066 (the secondary fill of pit 3067) and 3073 (the fill of pit 3074).

#### Phase 6: Upper organic mound

The upper organic mound (4172, Phase 6) included a suid peripheral first phalanx recovered from a sample residue. The phalanx was fully fused, but its size (Table 1) does not indicate whether it was from a domestic pig or wild boar.

**Table 1: Recorded measurements (in mm)**

Phase	Context	Element	Measurements (in mm)						
<i>Suid (pig/wild boar)</i>			<i>Measurements following von den Driesch (1976)</i>						
			<b>GLI</b>	<b>GLpe</b>	<b>Bp</b>	<b>SLC</b>	<b>SD</b>	<b>Bd</b>	
6 (tunnel)	4172	1 <sup>st</sup> phalanx	-	24.4	10.6	-	7.6	8.2	
17 (summit)	4886	Astragalus	37.1	-	-	-	-	-	
20.2 (tunnel)	3808	Scapula	-	-	-	20.3	-	-	
<i>Equid (horse/donkey)</i>			<i>Measurements following von den Driesch (1976)</i>						
			<b>GL</b>	<b>Bp</b>	<b>BFp</b>	<b>Dp</b>	<b>SD</b>	<b>Bd</b>	<b>BFd</b>
20.1 (summit)	4805	1 <sup>st</sup> phalanx	80.0	54.1	48.1	33.8	33.7	46.14	42.0
<i>Corvid (rook or crow)</i>			<i>Measurements following Tomek &amp; Bocheński (2000)</i>						
			<b>f</b>	<b>g</b>	<b>h</b>				
20.2 (summit)	4810	Ulna	8.8	7.9	6.1				

#### Phase 20.2: 20<sup>th</sup>/21<sup>st</sup> Century activity

Two suid bones were hand collected from modern deposits in the tunnel: Atkinson backfill 3804 contained a tibia and collapse from Bay 2 (3808) contained a scapula. Both specimens may represent redeposited material from earlier phases or later intrusions incorporated into the backfill and collapse. Although the scapula is small (Table 1), it is within the range recorded elsewhere for recent and prehistoric wild boar (Magnell 2006, 125, 131) and so may be either pig or wild boar. The tibia is immature and so also cannot



be identified to species based on size. A single micro-mammal incisor was recovered from a sample of collapsed turf stack material (3855) found over Bay 74.

### **Animal bones from previous excavations in the tunnel**

The 1968-9 tunnelling also produced a small assemblage of animal bones, including pig, cattle and sheep or goat and shrew or vole (Gardner 1997) and red deer antler.

### **Animal bones from summit excavations**

The majority (98%) of the countable animal bone assemblage was recovered from excavations on the summit of Silbury Hill. Hand collected bones (Table 2), and those retrieved from samples (Appendix 1), were recovered from Phase 16.2, 17, 18, 20.1 and 20.2 deposits, although a number of badger and amphibian bones, which were found throughout the phases, suggest that there may be a significant amount of contamination between deposits. These are discussed further below.

The assemblage holds little economic information for husbandry or hunting during each phase of activity and there are too few bones to consider the relative proportions of species in any meaningful way. Conclusions are therefore largely limited to the occurrence of species within phases.

Both domestic and wild taxa were recovered from all phases containing animal bones. Domestic species represented at least 38 percent of all hand collected remains; cattle bones were recovered from all phases, sheep or goat and pig or possible pig from all phases except phase 18, cat from phase 17, horse from phase 20.1 and chicken or galliform bones from phases 17 and 20.1. Domestic cats, horses and chickens were not present in Neolithic England, so would not be expected in Phase 16.2 contexts.

Wild taxa were well represented in the assemblage: red deer bones were recovered from phases 16.2, 20.1, 20.2, and possible red deer bones from phase 18; red fox bones were recovered from phases 17 and 18; hare and lagomorph bones from phases 17, 18, 20.1 and 20.2; and badger bones from all phases except 18. A few bones of smaller taxa (mole, possible black rat, water vole, small rodent, corvid and amphibian) were also hand collected from deposits of all phases, while sample residues also included shrew and probable polecat, and often contained large numbers of anuran bones. Fish remains were recovered from phase 17 and 20.2, which Rebecca Nicholson identified as eel and perch respectively. The taxa identified in each phase and context can be found in Appendix 1.

*Table 2: All recordable hand collected animal bones recovered from the summit excavation quantified by NISP and presented by phase*

Species	Phase						Total
	16.2	17	18	20.1	20.2	Unstrat	
Cattle	2	2	1	9	1	-	15
Sheep/Goat	3	5	-	10	1	4	23
Pig	-	7	-	8	3	1	19
Pig?	1	-	-	-	-	-	1
Horse	-	-	-	2	-	-	2
Cat	-	2	-	-	-	-	2
Red deer	1	-	-	1	1	-	3
Cattle/Red deer	1	-	1	-	-	-	2
Cattle/Red deer?	1	-	-	1	-	-	2
Red fox	-	1	-	-	-	-	1
Red fox?	-	1	1	-	-	2	4
Large mammal (vertebra + ribs)	-	2	1	4	-	-	7
Medium mammal (vertebra + ribs)	3	1	1	12	3	1	21
Hare	-	-	-	-	1	-	1
Lagomorph	-	2	-	1	-	-	3
Badger	2	4	-	5	1	2	14
Badger?	-	4	-	6	-	-	10
Mole	1	-	-	-	1	-	2
Black rat?	-	-	-	-	1	-	1
Water vole	-	1	-	-	-	-	1
Small rodent?	-	1	-	-	-	-	1
Chicken	-	1	-	-	-	-	1
Chicken/Guinea fowl/Pheasant	-	-	-	-	-	1	1
Chicken/Guinea fowl/Pheasant?	-	-	-	1	-	-	1
Corvid	-	-	-	-	1	1	2
Toad	-	-	1	-	-	-	1
Amphibian	2	11	5	2	-	3	23
Perch	-	-	-	-	1	-	1
Totals	17	45	11	62	15	15	165

The phase 20.1 assemblage was hand collected from topsoil (4804), subsoil (4805) and the fill (4806) of a tree hollow (4807). Similarly, the phase 20.2 assemblage was recovered from topsoil (4801) and trench backfill (8402/4810). Ordinarily animal bone from these contexts would be considered to be of probable mixed and recent origin and therefore not considered further. However, in this instance, the location of the deposits on the summit of Silbury Hill, suggests that they are not the result of manuring, and unlikely to reflect casual discard. The presence of elements of a badger skeleton, which was also recovered from earlier deposits, together with large and medium domestic mammal bones, suggests that the bones may result from disturbed archaeological activity on the hilltop. They were therefore fully identified and are reported here.

The surface condition of hand collected bones was generally good or moderate (Table 3), with no discernable differences between the phases, although as might be expected, those closer to the turf line displayed more ubiquitous root etching. Traces of carnivore and rodent gnawing were seen on a minority of bone fragments. Only one fragment displayed any signs of burning.

**Table 3: Condition of hand collected bones (excluding teeth) from the summit, presented by phase**

Data	16.2	17	18	20.1	20.1	Unstrat.	Total
<i>Surface condition</i>							
Good	75%	70%	82%	60%	80%	87%	70%
Moderate	19%	16%	18%	31%	10%	7%	21%
Poor	6%	14%	0%	10%	10%	7%	9%
<i>Root etching</i>							
Present	25%	55%	36%	87%	70%	67%	65%
<i>Gnawing</i>							
Carnivore	6%	2%	0%	2%	0%	7%	3%
Rodent	0%	0%	9%	2%	0%	0%	1%
<i>Burning</i>							
Present	0%	0%	0%	2%	0%	0%	1%
NISP	16	44	11	62	10	15	158

Evidence of carcass processing was not commonly identified, however twelve bones from phases 17, 20.1, 20.2 and unstratified locations did bear butchery marks. The Phase 17 butchered bones comprised a pig tarsal from 4820, which indicated that the foot had been disarticulated at this point, and a badger sacrum from 4826, which is further discussed under 'the badger bones' below. The phase 20.1 butchered bones comprised two medium mammal lumbar vertebrae, a pig skull fragment and a sheep tibia and scapula. The butchery marks primarily represent division of the carcass through portioning the spine, removing loin cuts, axially splitting the scapula, and removal of the mandible. A medium mammal rib from phase 20.2 backfill 4802 has been disarticulated and its meat filleted. The four unstratified butchered bones were a large- and a medium- mammal lumbar vertebra, and a sheep or goat sacrum and scapula. The vertebrae exhibited chops from the division of the spine and the butchered sacrum indicated portioning into left and right flanks. The scapula exhibited three puncture wounds to the blade, although whether these are a result of carcass processing or post-depositional damage is not clear.

## The badger bones

A total of 24 badger or probable badger bones were hand collected, representing the head, atlas, clavicle, ribs, vertebrae (including cervical vertebrae), pelvis, sacrum, left and right forelimbs and feet. A further 18 fragments were recovered from environmental samples (representing a cervical, thoracic and lumbar vertebra; ribs; a tarsal or carpal; a metapodial; a tibia and phalanges). The bones represent a minimum of one individual, based on minimum number of elements, taking into account bone development. Fused rib heads; distal scapula; proximal and distal humerus and radius; proximal ulna; and metapodials (with the exception of one unfused distal metapodial) indicate that the animal was skeletally mature. A tibia was fused at both ends, but with the proximal fusion line still visible, which indicates that it died at approximately 24-28 months old (following Ahnlund 1976). The left humerus and right radius exhibited strong muscle attachments, the radius also exhibited lipping on the proximal and distal articulations. The badger bones were found distributed through four phases of activity and fourteen different contexts within the small excavation trench, although with concentrations of eleven hand collected elements in phase 20.1 subsoil 4805, and seven hand collected elements in phase 17 possible pit fill 4826. They were originally thought to be indicative of animal disturbance to the archaeological layers. However, on closer examination it was noted that the sacrum from 4826 had been butchered with its caudal segment chopped off transversely (Figure 1). This indicates that at least some of the badger bones do not represent a natural death assemblage. Butchered badger bones are not commonly recorded in archaeological assemblages, although there are occasional popular and scientific references to badger meat being eaten (for example, see the badger recipes in Cameron 1977; Smith n.d., 36-7). One can speculate that the butchery of the sacrum might relate to discarding the badger's anal scent glands (see Corbet and Southern 1977: 359, 363) prior to further carcass processing, whether that be for the procurement of meat or the animal's skin and hair. Given the distribution of the bones and concentration in a Phase 17 context, it seems unlikely that the activity was Neolithic, with a medieval or modern source seeming more probable.



*Figure 1: Butchered badger sacrum (photo: author)*

## **The anuran bones**

Anuran bones were recovered from nearly every sample that contained animal bone, sometimes in very large numbers and usually vastly outnumbering any micro-mammal remains. While both frog and toad bones were identified, the majority were frog, often representing many individuals in each sample (see Appendix 1 tables). The frequent anuran remains probably represent natural casualties; animals either hibernating on the hilltop or inhabiting the hill. Their behaviour and small size allows their bones to travel within small voids in the hill and they may therefore be potentially intrusive in archaeological layers. Indeed, live frogs were seen on the summit during the excavation (cover photo).

## **Animal bones from previous excavations on the summit**

Identifiable animal bones from previous summit excavations comprised 179 fragments attributed to the Neolithic and 41 fragments attributed to the late Saxon period, but potentially derived from Neolithic contexts (Gardner 1987, 1997). The Neolithic assemblage included a range of domestic and wild species (cattle, pig, sheep, dog, red deer, fox, badger, hare and frog). Gardner (1987, 1997) believed the badger bones to be intrusive, noting 20<sup>th</sup> century badger setts close to the site (1987, 52). Gardner's reports (1987, 1997) also list beaver, but re-analyses of these fragments suggests that they are badger bones.

The Late Saxon bones included a range of domestic and wild species (pig, sheep, dog, red deer, roe deer and fox). Additionally, an assemblage of micro-mammal, amphibian and rabbit bones were recovered, but considered intrusive.

## **CONCLUSIONS**

The animal bone assemblage from excavations on the summit of Silbury Hill is poorly stratified and therefore also poorly understood. Some of the animal bones may represent a naturally accumulated death assemblage, but the presence of domestic species and those of larger wild taxa suggests human activity on the hilltop, although its nature cannot be known. The presence of horse and butchered badger bones, suggests that the assemblage most likely reflects various mixed activities, rather than simply food debris from occupation of the summit. Very little animal bone was recovered from the collapsed makeup of the hill during the tunnel excavation. All the recovered identifiable bones were cattle, suid (pig or wild boar), anura (frog or toad) and micro-mammal. The latter taxa representing animals inhabiting the local environment of the hill, whilst the cattle and suid remains may represent farmed or hunted species.

## APPENDIX I- TAXA IDENTIFIED IN THE SUMMIT EXCAVATION ASSEMBLAGES

### Phase I6.2: Final mound construction

The phase I6.2 assemblage was hand collected from interwall deposits (4813, 4835, 4843, 4844, 4845 and 4848) a chalk rubble wall (4808) and a chalk layer (4874), which was seen in the collapsed crater area. Phase I6.2 animal bones were also recovered from nine interwall deposit samples. The animal bone from sample residues was predominantly anuran but occasional pig, sheep or goat, badger, probable polecat and micro-mammal bones were also recovered.

*Table 4: Phase I6.2 hand collected assemblage by context*

Species	4808	4813	4835	4843	4844	4845	4848	4874	Total
Cattle	1	-	-	-	-	-	-	1	2
Red deer	-	-	1	-	-	-	-	-	1
Cattle/Red deer	-	-	1	-	-	-	-	-	1
Cattle/Red deer?	-	-	-	-	-	-	1	-	1
Pig?	-	-	-	-	1	-	-	-	1
Sheep/Goat	-	1	-	1	1	-	-	-	3
Medium mammal (vertebra + ribs)	2	-	-	-	-	1	-	-	3
Badger	-	1	-	-	1	-	-	-	2
Mole	-	-	-	1	-	-	-	-	1
Amphibian	2	-	-	-	-	-	-	-	2
Grand Total	5	2	2	2	3	1	1	1	17

*Table 5: Phase I6.2 bones collected from sample residues*

Context	4816	4817	4840	4843	4844	4845	4845	4846	4847
Sample	9522	9523	9515	9517	9527	9526	9537	9525	9524
<i>Micro-faunal from 2-4mm fraction</i>									
Weight (g)	-	<0.0	5.3	0.2	3.8	23.2	21.8	<0.0	<0.0
Quantity (g/l processed)	-	<0.00	0.42	0.02	0.76	1.86	8.72	<0.00	<0.00
<i>Micro-faunal from &gt;4mm fraction</i>									
Weight (g)	<0.0	-	3.9	0.2	1.0	3.4	4.6	-	<0.0
Quantity (g/l processed)	<0.00	-	0.08	0.01	0.05	0.07	0.46	-	0.00
<i>Species identified (two largest samples only)</i>									
Frog (MNI)	n/a	n/a	n/a	n/a	n/a	7	9	n/a	n/a
Common toad (MNI)	n/a	n/a	n/a	n/a	n/a	2	2	n/a	n/a
Vole sp.)	n/a	n/a	n/a	n/a	n/a	✓	✓	n/a	n/a
<i>Additional species identified (NISP, countable specimens only)</i>									
Sheep/goat	-	-	-	-	1	-	-	-	-
Pig	-	-	-	-	-	-	-	-	-
Badger	-	-	1*	-	-	-	-	-	-
Cf. Polecat	-	-	-	-	-	-	2	-	-
Medium mammal	-	-	-	-	-	-	-	-	-

\* Probable identification, MNI= Minimum Number of Individuals

## Phase 17: Medieval activity

The phase 17 assemblage was hand collected from fills 4820, 4822, 4824 and 4832 of definite or possible postholes 4821, 4823, 4825 and 4833; fill 4857 of pit 4858; secondary fill 4886 of possible pit 4876 seen in the crater; fill 4826 of pit or animal disturbance 4827 and fill 4828 of possible animal disturbance or root action. Samples from many of these contexts together with fills 4830, 4851 and 4869 of post hole and possible post holes 4831, 4852 and 4870; fills 4849 and 4853 of indeterminate features (root action, animal disturbance or possible post holes) 4850 and 4854; fill 4877 of possible pit 4878; fill 4834 of pit or animal disturbance 4827; and fill 4879 of possible pit or posthole 4880 seen in the crater, also contained animal bones, predominantly those of anura. A pair of refitting pig premaxillae from 4820 were submitted for radiocarbon dating, and produced a late ninth to early eleventh century calibrated date.

*Table 6: Phase 17 hand collected assemblage by context*

Species	4820	4822	4824	4826	4828	4832	4857	4886	Total
Amphibian	1	1	-	1	8	-	-	-	11
Badger	-	-	-	4	-	-	-	-	4
Badger?	-	-	-	3	1	-	-	-	4
Cat	-	-	-	2	-	-	-	-	2
Cattle	-	-	-	1	1	-	-	-	2
Chicken	1	-	-	-	-	-	-	-	1
Lagomorph	-	2	-	-	-	-	-	-	2
Large mammal (vertebra + ribs)	-	-	-	2	-	-	-	-	2
Medium mammal (vertebra + ribs)	-	-	-	-	-	-	1	-	1
Pig	3	-	-	-	-	1	-	3	7
Red fox	-	-	1	-	-	-	-	-	1
Red fox?	-	-	-	1	-	-	-	-	1
Sheep/Goat	-	-	-	3	-	-	2	-	5
Small rodent?	1	-	-	-	-	-	-	-	1
Water vole	-	-	1	-	-	-	-	-	1
Grand Total	6	3	2	17	10	1	3	3	45

*Table 7: Phase 17 bones collected from sample residues*

Context	4820	4822	4824	4826	4828	4830	4832	4834	4849	4851	4853	4857	4869	4877	4879
Sample	9503	9505	9506	9507	9509	9508	9510	9511	9518	9521	9520	9531	9516	9548	9549
<i>Micro-fauna from 2-4mm fraction</i>															
Weight (g)	3.4	3.1	8.2	7.1	14.3	1.9	4.8	0.6	2.5	8.3	2.0	15.9	9.2	3.5	7.0
Quantity (g/l processed)	0.34	0.50	1.09	0.71	1.43	0.22	0.48	0.12	0.50	1.11	0.30	1.59	1.05	1.00	2.00
<i>Micro-fauna from &gt;4mm fraction</i>															
Weight (g)	2.9	0.9	1.2	5.1	5.4	1.0	2.1	0.8	0.6	6.7	1.0	8.2	5.3	6.2	7.1
Quantity (g/l processed)	0.07	0.04	0.04	0.13	0.14	0.03	0.05	0.04	0.03	0.22	0.04	0.21	0.15	0.44	0.51
<i>Micro-mammal species identified (two largest samples only)</i>															
Frog (MNI)	n/a	n/a	n/a	n/a	15	n/a	n/a	n/a	n/a	n/a	n/a	17	n/a	n/a	n/a
Common toad (MNI)	n/a	n/a	n/a	n/a	6	n/a	n/a	n/a	n/a	n/a	n/a	5	n/a	n/a	n/a
Mole	n/a	n/a	n/a	n/a	-	n/a	n/a	n/a	n/a	n/a	n/a	✓	n/a	n/a	n/a
Vole sp.	n/a	n/a	n/a	n/a	✓	n/a	n/a	n/a	n/a	n/a	n/a	✓	n/a	n/a	n/a
Micro-mammal (post-cranial)	n/a	n/a	n/a	n/a	✓	n/a	n/a	n/a	n/a	n/a	n/a	✓	n/a	n/a	n/a
<i>Additional species identified in sample (NISP, countable specimens only)</i>															
Sheep/goat	-	1	-	-	-	-	-	-	-	-	-	-	-	3	1
Pig	-	-	-	-	-	-	-	-	-	-	-	-	-	2	-
Badger	-	1	2	-	3*	-	-	-	-	1*	1	-	-	1*	2*
Cervid/bovid	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-
Eel	-	-	-	-	3	-	-	-	-	-	-	-	-	-	-

\*Includes probable identification, MNI= Minimum Number of Individuals



## Phase 18: 1776 shaft and 18<sup>th</sup> century tree planting

The phase 18 assemblage was hand collected from interface layer 4837 and the fills of four indeterminate features: fills 4855 and 4859 of root action or animal disturbance features 4856 and 4860; fill 4861 of possible post hole 4862 and fill 4865 of root action or possible post hole 4866. The last two contexts also contained animal bones recovered from sample residues.

**Table 8: Phase 18 hand collected assemblage by context**

Species	4837	4855	4859	4861	4865	Total
Amphibian	1	-	-	1	3	5
Cattle	-	1	-	-	-	1
Cattle/Red deer	-	-	-	1	-	1
Large mammal (vertebra + ribs)	1	-	-	-	-	1
Medium mammal (vertebra + ribs)	-	-	1	-	-	1
Red fox?	-	-	-	-	1	1
Toad	-	-	-	-	1	1
Grand Total	2	1	1	2	5	11

**Table 9: Phase 18 bones collected from sample residues**

Context	4861	4865
Sample	9534	9535
<i>Micro-fauna from 2-4mm fraction</i>		
Weight (g)	7.4	2.0
Quantity (g/l processed)	0.99	0.80
<i>Micro-fauna from &gt;4mm fraction</i>		
Weight (g)	3.2	0.5
Quantity (g/l processed)	0.11	0.20
<i>Micro-faunal species identified</i>		
Frog (MNI)	12	3
Common toad (MNI)	2	-
Common shrew	✓	-
Vole sp.	✓	✓
Micro-mammal (post cranial)	✓	-
<i>Additional species identified (NISP, countable specimens only)</i>		
Lagomorph	1	-

MNI= Minimum Number of Individuals

## Phase 20.1: 20<sup>th</sup> century activity

The phase 20.1 assemblage was hand collected from topsoil 4804, subsoil 4805 and fill 4806 of tree hollow 4807. In addition to the fragments listed in the following table, a small piece of possible worked bone or ivory (8520) was recovered from topsoil 4804. The fragment was 15mm wide and 6mm deep in its oval cross section, broken at both ends to a length of approximately 19mm. The sides are smoothed and polished.

**Table 10: Phase 20.1 hand collected assemblage by context**

Species	4804	4805	4806	Total
Amphibian	-	2	-	2
Badger	-	5	-	5
Badger?	-	6	-	6
Cattle	-	9	-	9
Cattle/Red deer?	1	-	-	1
Chicken/Guinea fowl/Pheasant?	-	1	-	1
Horse	1	1	-	2
Lagomorph	-	-	1	1
Large mammal (vertebra + ribs)	-	3	1	4
Medium mammal (vertebra + ribs)	3	7	2	12
Pig	5	3	-	8
Red deer	-	1	-	1
Sheep/Goat	3	6	1	10
Grand Total	13	44	5	62

**Table 11: Phase 20.1 bones collected from sample residues**

Context	4805	4806
Sample	9502	9501
<i>Micro-fauna from 2-4mm fraction</i>		
Weight (g)	6.0	2.9
Quantity (g/l processed)	0.60	0.29
<i>Micro-fauna from &gt;4mm fraction</i>		
Weight (g)	3.9	0.0
Quantity (g/l processed)	0.10	<0.00
<i>Micro-faunal species identified</i>		
Frog	5	-
Common toad	2	1
Vole sp.	✓	✓
Micro-mammal (post-cranial)	✓	✓
<i>Additional species identified (NISP, countable specimens only)</i>		
Pig	1	1
Badger	6*	-

\* Probable identification, MNI= Minimum Number of Individuals

## Phase 20.2: 1968-70 excavations

The phase 20.2 assemblage was hand collected from topsoil above Atkinson's 1968-70 trench (4801) and its backfill (4802, 4810 and 4811).

*Table 12: Phase 20.2 hand collected assemblage by context*

Species	4801	4802	4810	4811	Total
Badger	1	-	-	-	1
Black rat?	-	-	1	-	1
Cattle	1	-	-	-	1
Corvid	-	-	1	-	1
Hare	1	-	-	-	1
Medium mammal (vertebra + ribs)	-	3	-	-	3
Mole	1	-	-	-	1
Pig	2	-	1	-	3
Red deer	-	1	-	-	1
Sheep/Goat	1	-	-	-	1
Perch*	-	-	-	1	1
Grand Total	7	4	3	1	15

\*R Nicholson notes that the perch bone was from a 20-25cm individual.

## Unstratified bones

The unstratified bones were hand collected from the collapsed are in the crater (4889).

*Table 13: Unstratified hand collected animal bones*

Species	4889
Amphibian	3
Badger	2
Chicken/Guinea fowl/Pheasant	1
Corvid	1
Medium mammal (vertebra + ribs)	1
Pig	1
Red fox?	2
Sheep/Goat	4
Grand Total	15

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