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FIGURES

1.0 INTRODUCTION

This document presents a summary report on some of the archaeological recording carried out at Silbury Hill by the Centre for Archaeology (CfA) of English Heritage. The report is a formalisation of the summaries of context, artefact and environmental data recovered during the fieldwork as set out in MAP2 Appendix 3 (English Heritage 1991, 30). It also encompasses a review or preliminary assessment of the significance of the data recovered and proposals where necessary, for further work.

The report encompasses the following archaeological recording exercises:

- Watching brief on the summit carried out on 11th December 2000.
- Excavation on the summit carried out between 14th and 22nd May 2001.
- Recording and sampling of the deposits in the crater on the summit on 9th and 10th August 2001.
- Re-locating the entrance to the 1968 tunnel.

Other archaeological fieldwork carried out during this period was:

- Recording the collapsed shaft and the deposits exposed in the interior of the hill (McAvoy 2000 and CfA report forthcoming).

- Remote recording of the deposits exposed in the sides of the collapsed crater (CfA report forthcoiming).

- Geophysical survey on the summit and slopes of Silbury by CfA in February and June 2001 (, Linford and Martin 2001).

- Detailed topographic and analytical survey of Silbury and the immediate landscape carried out during by Archaeological Survey of English Heritage (Field 2002).

2.0 BACKGROUND

On April 29th 2000 an approximately rectangular hole *c* 2.25m long and *c* 10m deep appeared at the top of Silbury Hill. This was the re-opening of a vertical shaft sunk in 1776 from the top to the base of the mound. A scaffold cover was erected over the opening with an archaeological watching brief carried out by the National Trust.

A desk-based assessment of the potential for archaeological recording of the deposits that might exposed in the shaft walls was prepared (McAvoy 2000a) and a brief physical inspection of the shaft was made in August 2000. A report on the preliminary results of the inspection, together with options for further work was presented in September 2000 (McAvoy 2000b).

Whilst these options were being considered the shaft walls collapsed in December 2000, leaving a crater on the summit 7.2m by 5.5m wide and 3.8m deep. On the southwest side of this crater was an area of slumped mound material 6.2m by 4m wide and up to 0.7m deep.

The crater was left uncovered but was surrounded by a substantial new fence, erected under a watching brief carried out by CfA (Cromwell 2001).

Recording the archaeology exposed in the sides of the crater commenced in early January 2001 once it was clear that a degree of stability had been reached on the summit. Direct access to the deposits was not possible because of Health and Safety concerns so the record made consisted of reflectorless EDM measurements and photography.

It was not possible to understand the nature and significance of those Neolithic deposits on the summit that had either been lost or disrupted or which were vulnerable to disruption in the near future. In order to address this, and to provide a record in case of further catastrophic collapse, resistivity and magnetometer surveys were carried out in February 2001 (Linford 2001) and excavation was carried out in May 2001 (McAvoy 2001a) to establish the immediate context of the deposits and their relationship with the archaeology of Silbury as understood from previous work.

By August 2001 a scheme was in place for infilling the hole and direct recording of the archaeology exposed in the sides of the crater took place immediately prior to this using Health and Safety measures put in place for the infilling operation.

In October 2001 the entrance to the tunnel dug in 1968 was exposed (McAvoy 2001b) to assist with the location of the positions of the various past interventions.

3.0 STRUCTURAL AND STRATIGRAPHIC SUMMARY

3.1 SHAFT EVALUATION

3.1.1 Method

Staff from English Heritage, CfA and its archaeological contractors were lowered into the shaft after a Safety Assessment had taken place.

A digital video recording and colour photography provides a further record of the exposed surfaces. Two sediment samples were taken for assessment.

3.1.2 Results

These are presented under three sub-headings: the shaft, the recent use of the monument and the archaeology.

3.1.2.1 The shaft

The shaft was recorded in a basic dimensional survey (Fig xx) carried out by Graham Daws Associates who also produced a report on the circumstances that resulted in its re-opening (summarised below).

The shaft is a square opening generally 1.8m wide, although broader at the top. The top of the collapsed infill is at a depth of *c* 10.3m from the surface and at approximately this depth part of the shaft wall had sheared away to create a cavity (Fig xx). This cavity gave an earlier impression that there were adits or laterals. There was no evidence that the shaft had been

capped close to the surface. There was, however, evidence of shear features and scoring on the shaft walls to indicate that an upper infill had been present and had fallen.

It is suggested that the formation of a cavity below the upper fill had left this isolated as an unsupported ‘plug’. The collapse of this plug may have been triggered by some form of changing water table or water migration as there were signs of water scouring at the ‘toe’ in Figure xx, section AA.

It is likely that the cavity below the upper fill in the shaft was formed through the collapse of the shaft wall into a lower void. This may have been a result of a progressive upward collapse within the mound, perhaps from a lower adit or from the various tunnels driven through at the base.

3.1.2.2 The recent use of the monument

A number of votive objects had been deliberately placed in the cavity between 12th July and 9th August. These were a cloth bull (Fig 3), a small nightlight, a black crystal and a knotted rope. These objects were left undisturbed in the evaluation.

3.1.2.3 The archaeology

Archaeological deposits were exposed in the walls of the shaft and cavity to a maximum depth of 13.5m from the top of the mound. These deposits can only be broadly characterised, with varying degrees of detail.

Two distinct phases of construction, each of differing character, were seen within the upper 13.5m of this part of the mound.

The earlier construction phase (from at least 13.5m to *c* 10.2m depth) is composed of well-modulated bands of chalky soil and chalk (Fig 4). A 0.5kg sample of the uppermost layer in this sequence was processed and provided a few fragments of charcoal of which *Corylus avellana* (hazel) and cf. Pomoideae (hawthorn) could be identified. Mollusc shells were absent but the residue contained possible Greensand grit (Robinson pers com).

This construction phase could have utilised soil and chalk derived from the stepwise cutting away of the local soil profile. The nature of the deposition sequence can be interpreted as resulting from either systematic mechanisms of excavation and transport or 'structured deposition' during construction (Canti, pers com). This clearance of the landscape could be related to the scarping of the adjacent slopes and/or the initial excavation of quarries or ditches.

The later construction phase (from *c* 9.8m upwards) is composed primarily of chalk rubble although there are soil lenses and quite thick layers of pale grey ?decayed chalk. No structural remains were noted although it must be emphasised that there was no systematic observation of these deposits. In addition the north side of the shaft was almost completely hidden by clay (Fig 5) which could have been spilt during the original excavation in 1776-7. This construction phase may have used material derived from the deeper excavation of ditches or quarries.

These two episodes of construction are separated by a dense layer of very white chalk, and above this, a layer containing sarsens and large chalk blocks.

The dense chalk layer represents a major event within the overall construction of the mound. Typically 0.08-0.12m thick and found at a depth of *c* 10.2m from the top of the shaft, this layer was present on all sides of the chamber and was slightly convex at its base. It is shown on the upper right corner of Figure 2 and in Figure 6. A 0.5kg sample from the layer was processed but no charred plant remains or molluscs were present.

Whilst the dense chalk is essentially a continuous band this is interrupted in two adjacent areas and these interruptions might represent *in situ* features (Fig 6). If man-made, then these could have been small pits or post-holes cut through the chalk or they may be the remains of upstanding features around which the chalk had been laid. Alternatively these features may be a result of trees or bushes rooting on the top of the chalk. There is, however, a possibility that these putative features are merely soil adhering to the exposed surface.

This dense chalk layer can be interpreted as having been deliberately laid down, perhaps to create a bright white capping or possibly a coating for the earlier construction phase. Alternatively the chalk layer could have been a platform or have been associated with construction.

The layer above the dense chalk was fairly thick (*c* 0.4m) and contained frequent sarsens and large angular chalk blocks (Fig 6) that may have been associated with an *in situ* activity prior to the later construction phase. In places this layer was beneath a further thick pale grey layer with small ?flint inclusions.

3.2 WATCHING BRIEF

3.2.1 Method

CfA carried out a watching brief during the construction of a post-and-wire fence beginning on Monday, 11 December. The fence required 28 wooden uprights, each set in holes approximately 0.3mx 0.3m across by 0.7m deep (Fig xx). The posts were set approximately 2.5m apart, and once the turf had been cut by spade as a plug, the holes were excavated mechanically by 10-inch powered auger.

The holes formed a square around the collapsed centre of the hill, and were numbered starting in the Northwest corner and proceeding clockwise.

3.2.2 Records

The watching brief produced the following records:

- 36 colour slide photographs held on 1 PhotoCD
- 1 sheet of A4 drafting-film containing notes along with a diagram of the holes.

3.2.3 Results

The overlying turf was fairly consistent, being approximately 0.08m thick with dark brown clayey silt soil that contained frequent chalk fragments approximately 10mm in diameter.

Below the turf, most of the holes came down onto large chalk fragments c 7-10mm diameter in a matrix of dark brown clayey silt. The chalk fragments constituted about 80 percent of the mix. There were occasional flint nodules averaging 0.1m in longest dimension.

Holes 2, 5, 6, and 7 had a soil/chalk mixture below the turf closer to 50/50 in ratio. This seemed to carry on the full depth of the holes. Hole 14 was unique, in that it had a layer of pure dark brown silt 0.3m thick extending from just below the turf, with a sharp transition to

chalk fragments in a silt matrix of the 80/20 ratio mentioned above. The transition was at a uniform depth around the circumference of the hole, suggesting that it had cut through a layer or a large feature.

3.2.3 Finds

Two holes produced finds. Because they were excavated by mechanical auger the finds are essentially unstratified but have been assigned context numbers for location and recording.

Hole 14 [context 17] produced three sherds of pottery, along with a nail and a piece of modern wire lead, complete with a miniature three-pin plug.

Hole 23 [context 18] produced three large sherds of medieval pot, including a substantial rim fragment.

3.2.4 Conclusion

Possible features can be assumed in holes 2, 5, 6, 7, and 14 due to changes in the soil, but hole 23 suggests that other features exist that are filled with a matrix similar to the material they cut, making identification difficult.

3.3 Remote recording of deposits in the side of the crater

3.4 EXCAVATION

3.4.1 Method

Two trenches were opened up to the east and west of the hole (Fig 1), adjacent to areas where the archaeological deposits were most intact and visible in the sides. Trench B was also sited over the west side of the large 'pit' anomaly. Excavation was limited to the depth required to expose structural features, which were then left *in situ*.

All excavation was carried out by hand with the topsoil metal-detected for artefacts. All other excavated sediment was either passed through a 10mm mesh on site or removed as samples for processing at Fort Cumberland (bulk samples) or in Oxford (molluscs). A complete record was made using standard CfA procedures.

After excavation ceased both trenches were backfilled, incorporating chalk from a quarry at Mere, near Salisbury, to replace the sediment removed for processing, and re-turfed.

3.3.2 Records

The excavation produced the following records:

- 15 context records
- 14 drawing records
- 75 photographic records
- 14 drawings on 7 A4 permatrace sheets (redrawn onto 5 A3 sheets)

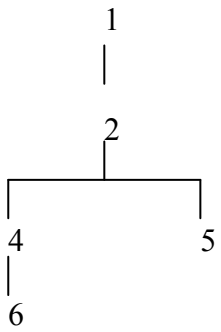
- 1 box index form
- 1 abbreviated small finds record, 13 small finds records
- 13 bulk finds records
- xxx sample evaluation records
- 2 PhotoCD discs
- 6 Black and White films

3.3.3 Results

TRENCH A

This was 3m long and 1.5m wide (4.5 sqm) and was located on the west side of the hole. Excavation took place to a general depth of 0.4m across the trench but to 0.5m within the limits of a possible circular feature (see below).

The stratigraphic sequence was as follows:



The volume of material excavated (litres) was as follows:

Context	Total vol. excavated	Dry sieved	Bulk sampled
2	680	590 (87%)	90 (13%)
4	290	200 (69%)	90 (21%)
5	90	60 (67%)	(33%)

The removal of the topsoil [1] revealed an underlying layer of small chalk fragments and peagrit [2} over the entire trench. Showing through this layer was some flint and sarsens (Fig 2, Dr 101). The surface of layer 2 was gridded out into 1m by 0.75m rectangles for sampling and artefact/ecofact recovery and location.

Layer 2 was removed down to a more compact layer [4] with more clay than [2] again present across the trench. Structured deposition of chalk became evident at this level represented by a line of chalk blocks perhaps delineated or cut through by a circular feature, on the north side of the trench.

Layer 4 was removed, leaving the chalk blocks in situ, down to a very compact layer [6] of pale brown silty loam, again present across the trench. The area within the circular pattern of chalk blocks was excavated [5] and was soft brown silt.

Further chalk blocks and rubble were uncovered at the base of context 5. At this point excavation ceased as it was clear that the structural evidence could not be understood without a wider area being exposed.

TRENCH B

This was 4m long and 1.5m wide (6 sqm) and was located on the east side of the hole. Excavation in general took place across the trench to a depth of 0.35m-0.45m but reached a depth of 0.75 in the east end of the trench, to the east of wall 7 (see below).

The stratigraphic sequence for this trench is as follows:

3

8 14

9

15

11

10

13 7 12

The volume of material excavated (litres) is as follows:

Context	Total vol. excavated	Dry sieved	Bulk sampled
8	680	590 (87%)	90 (13%)
14	250	220 (88%)	30 (12%)
9	180	120 (66%)	60 (33%)
10/11	270	170 (63%)	100 (37%)
12	30	-	30 (100%)

The removal of the turf and topsoil [3] exposed a surface of small chalk fragments and chalk peagrit [8] over most of the trench and a very similar layer [14] at the eastern end. The top of layer 14 sloped noticeably downwards at the east end of the trench. The surface of layers 8 and 14 was gridded out into 1m x 0.75m squares for sampling and artefact recovery and location.

Layers 8 and 14 were removed exposing a very substantial wall [7] running North-South and occupying most of the trench. The wall was composed of a chalk rubble core, with chalk at 0.10-0.20m in size, that lay between two chalk faces made of larger blocks c 0.35-0.40m in size.

At the west end of the trench was a short length of possible chalk walling [13] that could be continued in the adjacent face of the hole. At this west end excavation ceased above a layer of compact pale brown silty chalk [12] that either lay against or less likely was cut through by the walls.

At the east end of the trench the removal of layer 14 exposed the cut for the pit [15] indicated by the geophysical and topographic surveys. This was cut through two layers [10] and [11] and was filled by layer [9], a loose pale brown silty loam with chalk fragments.

It is possible that layer 14 was the final infill of this pit. Alternatively layer 14 may have formed at a later date infilling a depression caused by the underlying pit.

Layer 11 consisted of large chalk blocks loosely lying against the east side of wall 7. It contained a large number of voids and fell easily away from the sloping face of the wall. Layer 10 was beneath this at the east limit of the trench and was composed of very compacted chalk rubble.

3.4 RECORDING AND SAMPLING THE DEPOSITS IN THE CRATER

3.5.1 Method

All of the deposits in the faces of the hole were cleaned as best as possible but much of the exposed surfaces were slumped or collapsed deposits. It was decided to only record the northern face as this contained all the evidence for post-medieval activity relting to the shaft and later events, and was fully representative of the Neolithic deposits observed around the sides of the hole.

The drawn section was drawn 9.7m long and of the archaeological features exposed in Northern face of the hole. The section was 9.7m in length and a maximum of 2.6m in depth.

All the deposits were described and photographed using standard CfA recording procedures and three contexts were sampled for environmental evidence.

In addition the localised movemnet of material to level the base of the hole was monitored for artefact recovery.

3.5.2 Records

Recording the face of the hole produced the following records

3.5 RE-LOCATING THE 1968 TUNNEL ENTRANCE

4.0 ARTEFACT SUMMARY by Nicola Hembrey

4.1 Watching brief

As detailed above the CfA watching brief identified one possible archaeological feature, near the southwest corner of the fence. Seven sherds of pottery were recovered from this area; four from context 17 and three from context 18. These have been preliminarily identified (Dr Alan Vince, *pers comm*) as being fragments of Newbury Group B, with sand, flint and limestone inclusions, and with an earliest start date of late 12th / early 13th century. It is also worth noting that context 17 contained fragments of modern wire.

4.2 Excavation

Perhaps unsurprisingly on a site such as Silbury Hill, the excavation of May 2001 yielded a fairly small assemblage of finds, despite the intensive sampling strategy adopted.

Modern detritus, such as tent pegs, screws, bottle caps, bottle glass, ring pulls, and scraps of tin foil, was noted (collected and later discarded) within context numbers 1 and 3. Several modern coins, ranging from an 1881 half-penny to a 1956 six-pence, were collected from contexts 1, 3, 8 and 16.

Only 13 metal objects were collected, to be classified as small finds (an antler tine was also classified, as small find no 200100854, from context 11). All metal objects have been subject to X-Radiography, as part of archive completion. Of greatest note within the small find assemblage are the two objects to which some sense of date can be ascribed; the Roman coin (sf no 200100853) from within context 5, and the prick spur (sf no 200100851) from within context 14. Near-complete, with slender D-sectioned sides and rectangular terminals, and a short neck, which terminates in a quadrangular, lozenge-shaped goad, the prick spur is likely to be of mid-late 12th century date (cf no 319, p131, in Clark 1995). X-radiography has revealed possible tinning on the terminals, perhaps the remains of decoration.

The other small finds all consist of miscellaneous structural or domestic ironwork; one handle fragment (sf no 200100852), one bar fragment (sf no 200100856), four nail fragments (sf nos 200100855, 858, 859, 860), one pin (sf no 200100862), and 4 unidentifiable or amorphous fragments, simply classified as ‘objects’ (sf nos 200100857, 863, both from context 2, 861 from context 8 and 865 from context 16. These latter small finds do not easily yield an idea of date range; it is likely that they are all post-medieval in date. It is not anticipated that any further work on this assemblage will be necessary at an analysis stage, except for the identification of the Roman coin.

The material in greatest abundance was flint; 67 fragments were collected from within contexts 2, 4, 5, 8, 9, 10/11 and 14. That this quantity of flint was present within a large chalk structure is not surprising; a brief initial study of some of the assemblage has confirmed (Dr Andrew David, *pers comm*) that none of these fragments appear to be worked or utilised, and can be assumed to be natural. The fragments are therefore not diagnostic of any period or function. It is not anticipated that further work is necessary within a proposed analysis phase, subject to confirmation by Dr David, once he has been able to view the entire assemblage.

In addition to those fragments collected during the watching brief of December 2000, thirteen fragments of pot were collected, one or two from each of the following contexts: 1, 2, 4, 8, 9, 10/11, 14 and 16. Brief initial studies by Sarah Jennings, Rob Perrin and Pam Braddock have confirmed that almost all of these fragments are of similar fabric to those collected during the watching brief (identified as Newbury Group B, with sand, flint and limestone inclusions, and with an earliest start date of late 12th / early 13th century; Dr Alan Vince, *pers comm*). It is therefore presumed that almost all of the pottery assemblage is early medieval in date.

The only possible exception to this is a single fragment from context 4, which has been identified (F Healey, *pers comm*) as a Beaker sherd with chalk and grog inclusions, and exterior stamped decoration.

A single fragment of post-medieval tile was recovered from context 3, and four tiny fragments of ?post-medieval brick were collected from context 10/11. Context 9 yielded a small fragment of ceramic building material, possibly a form of baked clay, but this is too small to be diagnostic, and is presumed to also be post-medieval in date.

Two clay pipe stem fragments were collected, from contexts 2 and 14. These are also post-medieval in date.

4.3 Recording the deposits in the crater

A single fragment of antler tine was recovered, sf 2000100864, from context 30.

4.4 Conclusions

It can be said that the finds assemblage does not yield a great deal of information relating to either the construction or the usage of Silbury Hill. With the exception of the Roman coin and the Beaker pot sherd, the only closely dateable finds are the prick spur and the pot sherds, all of which are suggestive – at this stage – of a mid-12th to mid-13th century date.

The date of a bridle bit, collected in the eighteenth century, has been suggested by Evison (1969) as 9th or 10th century, although later thinking by Andrew Reynolds (in AAHRG 2001) has put it as 11th century, '…associated with the late Anglo-Saxon military activity on the summit of the hill'. This 11th century date also fits with the few artefacts collected during the 1970 excavations. This, together with the presence of a few scraps of post-medieval ceramic building material and clay pipe stems, along with the modern-day rubbish, confirms the continuation of usage of the site through time.

5.0 ANIMAL BONE by Polydora Baker

5.1 Excavation

During the 2001 excavation by the Centre for Archaeology on Silbury Hill, in May 2001, different forms of sampling were used to recover environmental remains and artefacts. Animal bones were recovered from dry-sieved samples and from the heavy residues from flotation, and are present in the flots themselves. In addition, a few animal bones were recovered by hand. This report focuses on the animal bone assemblage, with the aim of describing the types of material present and discussing whether they hold potential to inform on economy, environment and site formation.

5.1.1 Method

Soil samples of 30L or more were recovered from alternating $1m^2$ grid squares, for discrete layers. The remaining soil from discrete layers or features was dry-sieved through an 8mm mesh on site, and the volume of soil (and grid square where appropriate) was recorded. The soil samples were processed using water flotation; the flot was collected on a 0.25mm mesh and the heavy residue was collected on a 0.5mm mesh. In the laboratory, the >4mm fraction of the heavy residues was completely sorted for animal bones. The smaller fractions were not sorted except for 30% of sample 630 (context 10/11) (see Smith and Campbell 2001).

For the purpose of this evaluation, all animal bone was quickly scanned and the taxa present and approximate quantities were recorded. The flots and unsorted residues were scanned, in order to evaluate presence and abundance of taxa. Sheep deciduous teeth were identified following Payne (1985). Phil Piper (PhD candidate, University of York) provided a general list of the microvertebrates (order, family, genus or species) observed in the samples. Species presence and the approximate quantities of bone are indicated in Table 1. The number of ilia (part of pelvis) was noted as this bone is diagnostic in frogs and toads and provides an idea of the minimum proportion of identifiable amphibian bones in the samples (Bohme 1977).

5.1.2 Results

Hand-collection:

Only a few fragments of cattle, pig, red deer and bird were recovered by hand, from contexts 1, 3, and 5, all of which may be disturbed layers. A red deer antler tine recovered from a deposit of chalk rubble (context 11, sf 200100854) is reported on separately below.

Dry-sieved samples (>8mm):

The dry-sieved samples include remains of cattle, sheep/goat, pig, deer, hare, fox, small mammals (voles), and a few bird remains, including possible domestic fowl (samples 515, context 8; 518, context 14; 523, context 4). Many amphibian remains (mainly frog and some toad) are present, in particular in samples 503, 505, 506 (context 2), 511 and 515 (context 8). A very large red deer radius is included in sample 502 (context 2). The size of the bone is similar to that recorded for specimens from Mesolithic Star Carr (Legge and Rowley-Conwy 1988), and is larger than the modern red deer elements in the CfA skeleton reference collection. Unfortunately, both layers 2 and 8 are probably mixed so the provenance and date of the animal remains are uncertain. The integrity of layer 14 is also uncertain.

Heavy residues (>4mm and 2-4mm (Sample 630 only)):

The animal remains from the >4mm fraction of the heavy residues include a few sheep/goat, pig, and canid (possibly dog and/or fox) teeth and bones, hare and bird bones. A few small mammal bones and teeth, including voles and mole, were observed. Amphibian remains are present in large quantity in most samples, in particular in 603 (context 2), 614 (context 8), 619 (context 9), and 630 (context 10/11). The 2-4mm fraction from sample 630 includes many amphibian bones, which may include smaller species than observed in the >4mm fraction, as well as smaller elements of the larger taxa. Context 9 is a pit fill of 11th c. date or earlier, while context 10/11 consists of chalk rubble of probable Neolithic date (F. McAvoy, pers. comm. 2001). The unsorted 2-4mm residues, from other samples, in particular 614 and 615 (context 8) include a large proportion of amphibian remains.

Flots:

A few animal bones are included in the flots (see Smith and Campbell 2001). These include mainly amphibia, but one rodent bone was observed in sample 622 (context 5). Sample 630 includes many more amphibian bones than in the other samples, including possible metapodia and phalanges.

5.1.3 Discussion

A wide range of taxa is present in the samples from Silbury, including a few bones and teeth of the common domestic mammals, cattle, sheep and pig, as well as wild animals including red deer, fox and hare. Less common taxa include birds and small mammals. The vast majority of the finds however, consists of amphibian bones, recovered in the dry-sieved and flot heavy residues. The potential of the assemblages to inform on economy, environment and site formation is considered below. Unfortunately, the stratigraphic integrity and date of most contexts is uncertain, so this limits the value of any further work on these materials.

Economy

The assemblages from dry-sieving and flotation (heavy residues) yielded few remains of large domestic or wild animals, and will not inform on economy of the local population. At most it can be said that the remains of domestic and wild animals are present and may indicate local farming and hunting. Of interest are the red deer antler tine, which was found in the possible Neolithic layer of chalk rubble, and the large red deer radius, which from it's size suggests a prehistoric origin.

Environment

The sieved and floated assemblages yielded a large quantity of amphibian and fewer small mammal remains, which inform on local environment. The morphology of the innominate bone (which makes up 10-20% of amphibian bones in each sample), indicates that both frog and toad bones are present, including common toad (*Bufo bufo*) and common frog (*Rana temporaria*). Other species may also be present (also Phil Piper, pers. comm. 2001).

Site formation

The possible presence of domestic fowl in layer 8 suggests that this layer include intrusive and/or mixed material. It is thought that domestic fowl were introduced to Britain in the Iron Age (Crawford 1984; Zeuner 1963), so their presence at Silbury Hill would postdate mound building. Remains of hare may be from intrusive burrowing animals.

The large quantity of amphibian bones throughout the samples is intriguing. It is not certain if the remains are from pit trap victims, which fell into open spaces, including pits or voids in collapsed rubble, whether they were present in predator pellets or faeces, or in the soils that were used to build the mound. It is unlikely that the amphibian assemblage results from raptor pellets; amphibians make up only a small proportion of raptor diet and few other animals feed solely on frogs or toads (Phil Piper pers. comm. 2001b). Ponds form today at the base of the mound, and the ditches fill up with water also, providing an ideal habitat for waterfowl and no doubt amphibians. If these environments existed in the past, a natural amphibian death assemblage may have formed locally, which may have then been transported in the sediments onto the mound. Species composition, bodypart distribution and taphonomic alteration may help to elucidate the origin of the assemblage, which would inform on site formation, including the use of building materials and exposure of features.

5.1.4 Conclusions

The assemblage includes few macroremains, but many microvertebrate, mainly amphibian, bones. While most of the remains are from poorly stratified layers, two contexts merit further consideration, the fill (9) of pit 15 and the chalk rubble (10/11) in Trench B. The microvertebrate assemblages from these contexts may inform on site formation and should be assessed. A proportion of the <4mm fraction of the heavy residues should be sorted and assessed also.

5.1.5 Antler tine (200100854)

The specimen consists of a broken tine (part nearest the tip) which shows breakage and polishing at the tip. It is 122mm long and 2mm across at its broadest breadth. The size and shape of the tine, and the strong surface pearling (knobbly modelling) indicate that the antler is from a red deer. The specimen is robust and is probably from a large and/or old male. The size and surface development are very similar to tines on an antler of a modern 20+ year old red deer at the CfA (Davies 1997, AML #8). The position of the tine is uncertain; while the tine is not markedly curved, it is not possible to say whether it is a brow tine or from another location on the antler.

The breakage and polishing at the tip of the tine are not dissimilar to modifications observed on the tines of the unshed antler of the above-mentioned skull. Antlers may be damaged in various ways. During the rut stags fight with their antlers. Occasionally red deer have been observed to use their antlers for breaking branches while searching for food (Corbet and Southern 1977), and they will also rub their antlers against trees when velvet, which covers the antler during the first months of growth, is being shed (ref???). All of these activities may result in chipping, breakage and polishing.

Antler was commonly used for making various objects throughout the prehistoric and historic periods, and was collected once shed or obtained from hunted animals. The origin of this antler, however, is uncertain. The availability of only a single tine does not allow us to say whether it is from a hunted animal or from a shed antler, and we cannot say whether the tine is culturally modified. Antler picks from Stonehenge (Sergeantson and Gardiner 1995) show that the tines were in some cases reduced to relatively straight but short pointy stumps, while others are longer and better preserved. The Silbury specimen is very well preserved, but it undoubtedly was much longer than its current form. The tine may be waste from an antler that was collected and/or used for working, or it may be from an antler pick. However this cannot be confirmed with any certainty; the modifications are similar to breakage and wear that occur naturally to antlers during a stag's lifetime.

5.2 Recording and sampling deposits in the crater

5.2.2 Antler tine (200100864)

A further fragment of an antler tine was recovered during the cleaning of the deposits exposed in the sides of the crater. As with the first tine, the size of this specimen and strong pearling of the antler surface suggests it is from a red deer. The specimen is split lengthways, and measures 156.5mm in length and 32.6mm at its greatest breadth. The shape of the fragment and the presence of much cancellous bone suggests that it is from part of the beam of from the base of a large tine, rather than from near the tip of a tine, where the bone would be more compact (MacGregor 1985, 12).

Wear is visible at one end of the fragment on the external surface, on part of the internal broken edges of the cancellous bone, and on part of the edges lengthways (to 100-200mm from the end). The origin of the wear, whether natural or cultural, is uncertain. The antler may have been partly broken during the stag's lifetime, through rubbing, digging or fighting but is unlikely that it would have broken lengthways. It is more probable that the splitting occurred after deposition, once it had lost some collagen and become more brittle. Alternatively the antler may have been worn through human use but is is uncertain if it was:

Collected from a hunted animal or once shed, split intentionally and used
Used then abandoned after which it split
Collected in its broken state and used.

With regard to the first suggestion, possible abrasion may be seen on the split edges, in addition to the wear described above, but this may have occurred after deposition. There are no obvious toolmarks. One very fine incision is present on the worn external surface but the origin of this is also uncertain.

5.3 Acknowledgements

I would like to thank Wendy Smith, Gill Cambell, and the volunteers-David Green (trident student), Christine Kackman, Claire Jones, Sheila Keyte, Kirsty Stonell, Mary Walkden, David Webb, Roger Wilkes, Philip Wimbleton- who sorted the samples from Silbury. I also thank Phil Piper (University of York) for scanning the dry-sieved remains and providing a preliminary species list.

Context	Sample	Macrofauna*	Birds	Microfauna **	Innominate ***	Observed taxa (other than frog/toad)
		N	N	N	N	
Dry-sieved (>8mm)						
2	501	1	1			pig, crow size bird
2	502	1				red deer radius
2	503	5		20	nc	fox, antler
2	504	2				fox, antler
2	505	6		30	nc	deer tooth, hare/small carnivore, frog, toad
2	506	1	1	40	7	water vole
8	511	3		30	6	Cattle, sheep, pig, frog, toad
8	512			50	10	frog, toad
8	514	1		1		
8	515	2	1	100	16	juvenile domestic fowl, sheep, pig, common toad, common frog, water vole
8	516			6	2	frog
14	517			2		
14	518	2	1	11		pig, domestic fowl, hare?
9	519			2		
4	520	2		2		sheep/goat, pig
4	521			2		
5	522			10	1	
4	523	6	1	10	1	domestic fowl, fox, hare
Heavy residues (>4mm fraction): 630* 30% of 2-4mm fraction						
2	602	1		25	3	sheep, frog
2	603	4		120	10	canid, vole, mole
2	606	5		35	4	sheep/goat, canid, water vole, , other vole
8	611	1		40	12	pig
8	614			250	50	mole
8	615	1		30	6	sheep/goat
14	618			20	2	
9	619			100	10	
4	620			30	4	
4	621			7		
5	622	2		30	6	bird (thrush-corvid size), vole
4	623	4		10	4	canid, fox, mole?
10 and 11	630			150	20	frog, toad
10 and 11	630*			250	15	vole,
Hand-collected remains						
1		1		1		lagomorpha
3		4	1			cattle, sheep/goat, domestic fowl, large cervid
4		1				cattle

Table 1: Distribution of animal remains in dry-sieved samples and heavy residues (N)
N: approximate counts (N) for macrofauna and birds-recordable elements; for microfauna-all remains
*hare to cattle size; Microfauna**: almost exclusively amphibia;
*** Amphibia innominate counts included in microfauna total

6. MOLLUSCS by Mark Robinson

6.1 Assessment of Potential

6.1.1 Introduction

Two trenches were excavated on the top of Silbury Hill in May 2001 by Mr F McAvoy of Central Archaeological Services (English Heritage). The purpose of the excavation was to establish the nature and significance of Neolithic deposits currently being lost by collapse into the 1776 shaft. The aims of this work included the sampling for molluscs both Neolithic chalk rubble walls known to exist on the top of the mound and the infilling between them. The purposes of the molluscan investigation were to obtain information on general environmental conditions, the origin of the deposits and whether or not the tops of the wall had remained exposed after the completion of the monument.

6.1.2 Data

Quantification

Five columns totalling 18 samples were taken from the sides of the trenches, for molluscs. A further three individual samples were also taken. The mollusc samples are slightly over 1kg each and they come from the full range of contexts. In addition, shells were saved from bulk samples of around 80 litres which were dry-sieved through an 8mm mesh on site.

Data Collection and Method Statement

It was decided to assess four samples from Trench B to cover the range of archaeological deposit types: Sample 669 from a wall, Sample 665 from loose rubble infill between walls, Sample 666 from the fill of a Neolithic pit and Sample 663 from a layer beneath the topsoil in which an early medieval spur was found.

1kg of each of these samples was washed over onto a 0.5mm mesh to float off shells and the residue was also sieved over a 0.5mm mesh. Both flots and residues were then dried. For the purpose of the assessment, the flots were scanned under a binocular microscope at x12 magnification and an estimate made of the abundance of each species identified. The results are given in Table 2. *Cecilioides acicula* has been excluded from the estimated total because it is an intrusive burrowing species.

The snail shells from the dry bulk sieving are dirty and not readily identifiable, beyond it being obvious that the majority are *Arianta* / *Cepaea* sp. Therefore, a selection of them were washed, dried and identified under a binocular microscope. This confirmed that *Arianta arbustorum*, *Cepaea hortensis* and *C. nemoralis* are all present. There are also a few large specimen of *Helicella itala* and *Trichia hispida* gp.

6.2 Statement of potential

Preliminary Interpretation

Useful quantities of well-preserved shells are present in most of the samples. Not surprisingly, the lowest concentration of shells is present in Sample 669, from the top of the chalk wall. They

comprise catholic species *Trichia hispida* gp. plus a few shells of open-country species such as *Helicella itala*. They do not comprise a rock-rubble fauna and probably represent shells worked by earthworm action through a covering soil into the top of the wall. In contrast, the molluscs from Sample 665 from the loose chalk rubble infill between the walls are mostly two woodland species that are also very characteristic of buried rock-rubble habitats, *Vitrea* cf. *contracta* and *Oxychilus cellarius*. They probably lived underground in the voids between the chalk fragments.

The highest concentration of shells occurs in Sample 666 from the fill of a Neolithic pit. The assemblage is dominated by *Trichia hispida* gp. and an open-country species, *Pupilla muscorum*. Two other open-country species *Vallonia excentrica* and *Helicella itala* are also present. They suggest open, probably grassy, conditions on the top of the mound as the pit filled. Sample 663 from the general layer beneath the topsoil also contains *Trichia hispida* gp. plus open-country species, although *Pupilla muscorum* is absent, suggesting that there had been a change in open conditions.

The snails from the bulk sieving are mostly catholic species that can occur in both open and wooded habitats. However, the presence of *Arianta arbustorum* implies that there were at least a few tussocks of grass on the monument to provide it with humid sheltered conditions.

Potential for Further Analysis

The assessment has shown that the samples from Silbury Hill contain useful quantities of well-preserved land snails that are capable of providing palaeoenvironmental information about the monument. The full analysis of a sequence of samples expanded from the sequence that was assessed has the potential to provide details of general environmental conditions and the state of the chalk rubble constructions, as specified in the research aims. The main limitation is the lack of close dating for the post-Neolithic contexts. The potential of the shells from the coarse-sieved samples is less although the identification of shells from those contexts from which 1kg samples are to be analysed in detail is likely to confirm the identity of some of the larger species only represented by shell fragments in the 1kg samples.

Column / Section	555	545		545
Sample	669	665	666	663
Context	7	11	15	14
Cochlicopa sp.	-	-	+	-
Pupilla muscorum (L.)	+	+	+++	-
Vallonia costata (Müll.)	-	-	-	+
V. excentrica Sterki	-	-	+	+
Vallonia sp.	+	+	+	+
Vitrea cf. *contracta* (West.)	-	++	+	+
Oxychilus cellarius (Müll.)	-	++	-	-
Cecilioides acicula (Müll.)	+	-	+	++
Clausilia bidentata (Ström)	-	-	-	+
Helicella itala (L.)	+	+	+	+
Trichia hispida gp.	++	+	+++	+++
Cepaea sp.	-	+	+	+
Estimated total excluding *Cecilioides acicula*	15	25	75	50

+ present, ++ 6-10, +++ 11+

Table 2: Assessment of Land Snails

7.0 **Charred plant remains and charcoal** by Wendy Smith and Gill Campbell

7.1 Introduction

The excavation included collection of samples from all contexts excavated. Three forms of environmental sampling were carried out during excavation: 1) soil samples from on-site dry sieving, 2) soil samples for bulk processing (i.e. general biological samples) and 3) column samples for recovery of molluscs. This evaluation addresses the charred plant remains and charcoal recovered from on-site dry sieving or bulk soil samples. The number of bulk soil samples and dry-sieved sampled collected and a list of the material retained from these sampling programmes is summarised in Table 1.

7.2 Fieldwork and Laboratory method

Where homogenous layers were present, the layer was divided into $1m^2$ grid squares and a 30 litre whole earth sample was collected from alternate and opposing grid squares. In circumstances where it was possible to collect more than 30 litres of soil, additional soil was collected.

Soil samples that were dry-sieved on site by the excavators were sieved over an 8 mm mesh. An environmental assistant or supervised volunteers processed all bulk soil samples using water flotation. The flots (the material which floats) were sieved to 0.25 mm and the heavy residues (the material which does not float) were washed over a 0.5 mm mesh sieve, and both were air-dried. Supervised volunteers sorted 100% of the >4mm fraction of the heavy residues by eye, under the supervision of Gill Campbell or Wendy Smith. With the exception of one sample (630) the <4 mm fraction was not sorted during this stage in the post-excavation programme. One-third of the 2-4 mm fraction of the heavy residue for sample 630, however, was sorted and is reported here. With the exception of two samples (513 and 524), all dry sieved samples were sorted by Wendy Smith. The flots were rapidly scanned by Wendy Smith, using a standard low-power binocular microscope, at a magnification of x12. The results for the bulk processed soil samples presented here are based on both the heavy residues and the flots.

7.3 Results

The results for the dry-sieved soil samples are presented in Table 3 and the results for the bulk soil samples are presented in Table 4.

7.4 DISCUSSION

The sampling programme implemented at Silbury Hill (661) had two main aims:

1. To determine if interpretable charred plant remains (including charcoal) were present.

2. To determine if sufficient quantities of charcoal survived to support a dating programme.

It is clear that the sampling programme has not produced assemblages of charred plant remains (including charcoal) that are of interpretable value. There are also only a few samples (520, 603, 619 and 620) which have produced small quantities of charcoal.

Only two charred seeds were recovered. A free-threshing wheat (*Triticum* sp.) grain was recovered from sample 619 (context 9 – a pit fill dating to the 11th century AD or earlier) and an indeterminate caryopses of either a large wild grass or a cereal was recovered from sample 630 (contexts 10/11 – layers against the wall).

Most samples contained modern insects, root matt, worms and worm casts, which suggests that these contexts are likely to contain modern contamination, which may well include charred plant remains. As a result, it is not recommended that this material is used for the dating programme at Silbury Hill (661).

7.5 CONCLUSION

The sampling programme from Silbury Hill (661) has not produced any assemblages of charred plant remains (including charcoal) that are of interpretable value. Given the large quantity of modern contaminants (insects, roots, worms, etc…) in these samples, the antiquity of the charred plant remains recovered is somewhat in doubt. As a result, it is not recommended that the charred plant remains are used in the dating programme

7.6 ACKNOWLEDGEMENTS

Evaluation of the Silbury Hill (661) samples was funded by English Heritage. Our thanks to the many volunteers – David Green (Trident Student), Christine Jackman, Claire Jones, Sheila Keyte, Kirsty Stonell, Mary Walkden, David Webb, Roger Wilkes and Philip Wimbleton – who helped in the processing and sorting of these samples.

Dry-sieved Samples				
Total Number of Samples Collected	**Sample Numbers Used**	**Material Retained**	**Box Number**	**Samples Numbers included in Box**
21	501-506, 512-524 and 530	Charcoal	2 (Standard Box)	520

Bulk Soil Samples				
Total Number of Samples Collected	**Sample Numbers Used**	**Material Retained**	**Box Number**	**Samples Numbers included in Box**
14	602-603, 606, 611, 614-615, 618-624 and 630	Flots	2 (Standard Box)	602-603, 606, 611, 614-615, 618-624 and 630
		Charcoal (>4mm fraction of Heavy Residue)	2 (Standard Box)	603, 619 and 620
		Representative sub-sample molluscs (>4mm fraction of Heavy Residue)	2 (Standard Box)	630
		Unsorted <2 mm fraction and 66% 2-4 mm fraction of heavy residue	6 (Skull Box)	
		Unsorted <4 mm fraction of heavy residue	3 (Standard Box)	614, 615, 619, and 620
		Unsorted <4 mm fraction of heavy residue	4 (Standard Box)	602, 6023, 606, and 611
		Unsorted <4mm fraction of heavy residue	5 (Standard Box)	621, 622, 623 and 624

Table 3: Record of samples collected and material stored from Silbury Hill (661)

Sample	Context	Sample Vol. (L.)	Charred plant remains	Molluscs (land snails)	Animal bone	Charcoal
501	2	90	-	6	7	-
502	2	60	-	10	4	-
503	2	90	-	ca. 40	ca. 30	-
504	2	130	-	11	4	-
505	2	120	-	ca. 100	ca. 50	-
506	2	100	-	14	ca. 50	-
511	8	70	-	4	ca. 50	-
512	8	160	-	4	ca. 50	-
513	8	90	Sample possibly sorted on site. No evaluation form filed.			
514	8	140	-	12	3	-
515	8	70	-	21	ca. 100	-
516	8	60	-	15	7	-
517	14	140	-	14	55	-
518	14	80	-	20	25	-
519	9	120	-	3	1	-
520	4	70	-	8	5	3
521	4	70	-		2	-
522	5	60	-		18	-
523	4	60	-	8	ca. 40	-
524	12	40	Sample possibly sorted on site. No evaluation form filed.			
530	10/11	170	-	2	-	-

*With the exception of samples 513 and 524, all other dry-sieved samples were sorted by Wendy Smith at CfA.

Table 2: Evaluation of charred plant remains and charcoal from Silbury Hill (661) dry-sieved samples.

Table 3: Evaluation of charred plant remains and charcoal from Silbury Hill (661) bulk soil samples.

				FLOT				HEAVY RESIDUE			
Sample	**Context**	*Sample Vol.* **(L.)**	**Flot Vol. (ml)**	**Charred plant remains**	**Molluscs (land snails)**	**Animal bone**	**Charcoal**	**Charred plant remains**	**Molluscs (land snails)**	**Animal bone**	**Charcoal**
602	2	29	250	-	++++	+	+	-	N/R	***	-
603	2	26.5	200	-	++++	-	+	-	N/R	****	*
606	2	27	300	-	++++	+	-	-	N/R	***	-
611	8	27	300	-	++++	++	-	-	N/R	***	-
614	8	26.5	250	-	+++	+	-	-	N/R	****	-
615	8	29.5	300	-	++++	+	+	-	N/R	***	-
618	14	31.5	300	-	++++	-	+	-	N/R	***	-
619	9	48.25	275	1 charred free-threshing wheat grain	++++	++	+	-	N/R	****	*
620	4	31	105	-	++++	+	+	-	N/R	***	*
621	4	25.5	80	-	+++	+	+	-	N/R	**	-
622	5	27.5	100	-	+++	++	-	-	N/R	***	-
623	4	28.5	100	-	++++	+	-	-	N/R	***	-
624	12	28	20	-	++	+	+	-	N/R	***	-
630[1]	10/11	87.5	100	1 charred cereal/ Lg. grass	++++	++	+	-	N/R	****	-

[1] *In all cases except sample 630, 100% of the >4mm fraction of the heavy residue was sorted for ecofacts and artefacts. In sample 630, 100% of the >4 mm fraction and 33% of the 2-4 mm fraction of the heavy residue were sorted.*

Key to symbols used:

3 = present
- = not observed
N/R = not recovered whilst sorting, although present in all samples
+ = < 10 items present
++ = 10 – 50 items present
+++ = 50 – 100 items present
++++ > 100 items present
* = 1-3 items
** = 4-10 items
*** = 11-50 items
**** = >50 items

8. Scientific dating

The two antler tine fragments were submitted for radiocarbon dating.

Dating certificate EH2001/17

Antler 200100854 (Lab reference 661-851)

OxA-10818 3953 BP ± 34
OxA-10819 3918 BP ± 36

Antler 200100864 (Lab reference 661-200100864)

OxA-11187 3946 ± 37
OxA-11188 3910 ± 37

Alex Bayliss pers comm

'Both pairs of measurements are statistically consistent (OxA10818-9; T' =0.5; T'(5%)=3.8;*v*=1;OxA-11187-88;T'=0.5;T'(5%)=3.8;*v*=1) and so weighted means can be taken before calibration (Ward and Wilson 1978).

The calibrated dates for the samples are therefore cal BC 2490-2340 (OxA-10818-9; 3937±25 BP) and cal BC 2490-2310 (OxA-11187-8; 3928±26 BP).'

9. Archive and curation

10. Recommendations for further work

STRUCTURE AND STRATIGRAPHY

The following work is required on the structural and stratigraphic record.

Data entry

Contexts
Photographic Records
Sample Records
Artefact Records

Data checking/editing

ARTEFACTS

It is not anticipated that a great deal of work on the finds is necessary at any proposed analysis stage. All metalwork has been subject to X-Radiography, and is packed to accepted CfA conservation standards. The only material worthy of further study – and mainly for dating - is the Roman coin and the pottery assemblage, as well as possibly the flint

assemblage, as suggested above (8.5). It would be of interest to carry out investigative conservation on the prick spur, to ascertain if tinning is indeed present.

Coin Identification
Pottery identification
Investigative conservation

ANIMAL BONE

MOLLUSCS

AIMS AND OBJECTIVES

Recommendations

It is recommended that a stratigraphic sequence of samples be analysed in full for molluscs from Trench B to cover the full sequence of deposits. The species of snail present in the coarse sieving from each of these contexts should also be identified, although they will not need to be quantified. The results should be interpreted so as to provide information on the structure of the monument and to provide a general palaeoenvironmental sequence. It is not thought necessary at this stage to analyse the samples from Trench A, which are regarded as giving a less good sequence, nor to analyses samples from Trench B which duplicate the basic sequence.

Samples for Analysis

It is recommended that the following samples from Trench B be analysed: Samples 669, 665, 666, 670, 663, 662.

Method Statement

1kg of each sample should be washed over onto a 0.5mm sieve to float off shells and the residue should also be sieved to 0.5mm. The dried flots and residues should be sorted under a binocular microscope for shells which should be identified using a reference collection. A table of results should be prepared, giving the minimum number of individuals represented by the fragments for each species in each sample. The results should be used to draw up a molluscan diagram.

Task List

Sieving and sorting of samples	- technician	3.0 days
Identification of shells	- specialist	2.0 days
Preparation of report	- specialist	1.5 days

Total technician time: 3.0 days, total specialist time: 3.5 days

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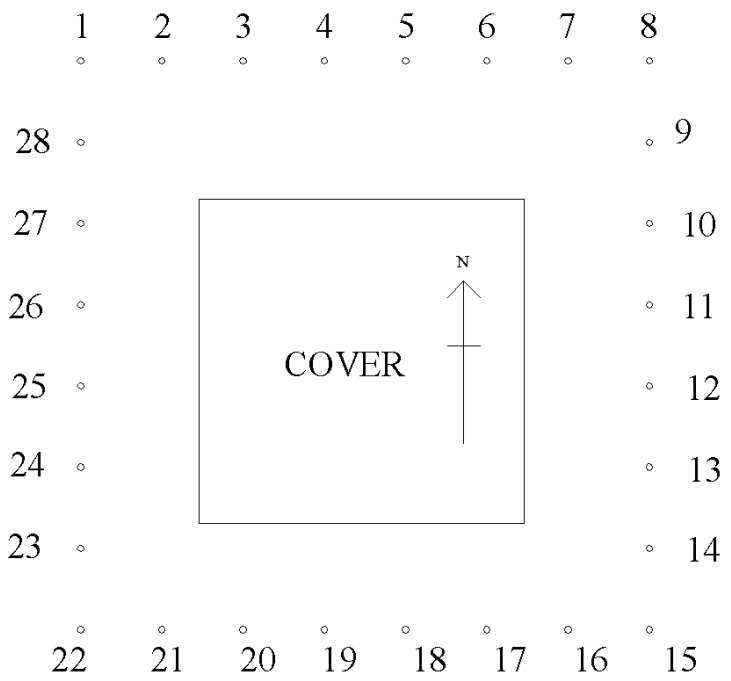

Sketch plan with numbering of holes. Note that North Arrow is only approximate.