CPAT Report No. 1459.1

Scethrog Cremation Burial, Powys

Archaeological Investigation

YMDDIRIEDOLAETH ARCHAEOLEGOL CLWYD-POWYS

CLWYD-POWYS ARCHAEOLOGICAL TRUST

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Summary

Following the discovery by a metal detectorist of a bronze knife and some cremated bone in a field near Scethrog in Powys (SO 10893 25741) in October 2016 a programme of archaeological investigation was undertaken by the Clwyd-Powys Archaeological Trust, with funding from Cadw.

The area of the find was the subject of a magnetometer survey, the results of which provided no evidence for any associated features, such as a ring-ditch, although there was tentative evidence for perhaps 5-10 small pits within the immediate area. This was followed by a small-scale excavation focusing on the find spot which revealed that the discovery had disturbed a cremation that had been placed within a pottery vessel in the base of a small pit, together with the bronze knife, a bronze pin and a worked flint. Radiocarbon dating of a fragment of cremated bone gave a probable origin of between 1750 – 1610 cal BC, which fitted in well with the suggested dating of the knife by staff of Amgueddfa Cymru – National Museum Wales on typological grounds to 1950 - 1500 BC.

Palaeoenvironmental and cremated bone analysis was carried out on the cremation by Archaeological Services, Durham University and revealed that the cremation represented a single adult, possibly male, who had suffered joint disease, soft tissue trauma and a dental abscess during life; very small amounts of charcoal thought to represent fuelwood for the cremation were identified, comprising oak, field maple and willow. Two charred barley grains from the near the base of the pot could represent food offerings burnt on the pyre, or the remains of ritual feasting associated with the funerary process. It was not possible to identify the time of year that the cremation took place but some of its characteristics might imply the development of a local or regional trend in burial practices in the later part of the Early Bronze Age.

It appeared that there was some pattern to the deposition of the cremation within the pottery vessel, with the analysis suggesting that the bones of the upper and lower limbs, and torso may have been preferentially, though not exclusively, placed into the urn first, with bone from the skull tending to be placed on top. The bronze objects appeared to have been placed in the vessel before most of the skull fragments were added. The presence of two items of prehistoric metalwork means that all material, except the cremated bone, is likely to be deemed treasure under the 1996 Treasure Act, and this has been reported to the coroner for the district.

1 Introduction

1.1. The following report relates to an archaeological investigation carried out by the Clwyd-Powys Archaeological Trust (CPAT) at the location where a bronze knife was discovered by metal detectorist Tom Haines on 26 October 2016, about 500m north-north-east of the village of Scethrog (Fig. 1: NGR SO 10893 25741) at an elevation of approximately 190m OD. The field in which the object was found has a moderate slope to the south, towards the River Usk, although at its southern edge the ground levels off, partly owing to the presence of a lynchet. It seems that the field is normally under arable cultivation, although it was not carrying a crop at the time the work was carried out.

Fig. 1: Location of the findspot at Scethrog

1.2. The knife was reported through the Portable Antiquities Scheme by the finder and was taken to Amgueddfa Cymru - National Museum Wales in Cardiff at the beginning of November to permit its identification and recording, with the involvement of Nigel Blackamore, Senior Curator of Brecknock Museum. A report (Appendix 2) was then compiled by Adam Gwilt and Louise Mumford of Amgueddfa Cymru - National Museum Wales, giving an assessment of the probable origins and dating of the knife. Some calcined bone was recovered along with the knife and its presence is noted in the report.

1.3. In response to the identification of the knife, CPAT applied to Cadw for funding to investigate the location and thereby provide information on the context from which it had been recovered. This was granted on 17th November and work commenced in the following week.

1.4. The investigations were conducted in two parts, starting with a magnetic gradiometer survey. This was carried out with the aim of identifying any sub-surface archaeology that may have been present in the wider area, specifically to determine whether there were traces of a round barrow or ring ditch at the find location. The survey was carried out on 23 November and was followed by an excavation at the find locality, undertaken on 29 and 30 November.

1.5. The work was conducted in accordance with the Chartered Institute for Archaeologists (CIfA) St*andard and Guidance for Archaeological Field Evaluation (2014)*.

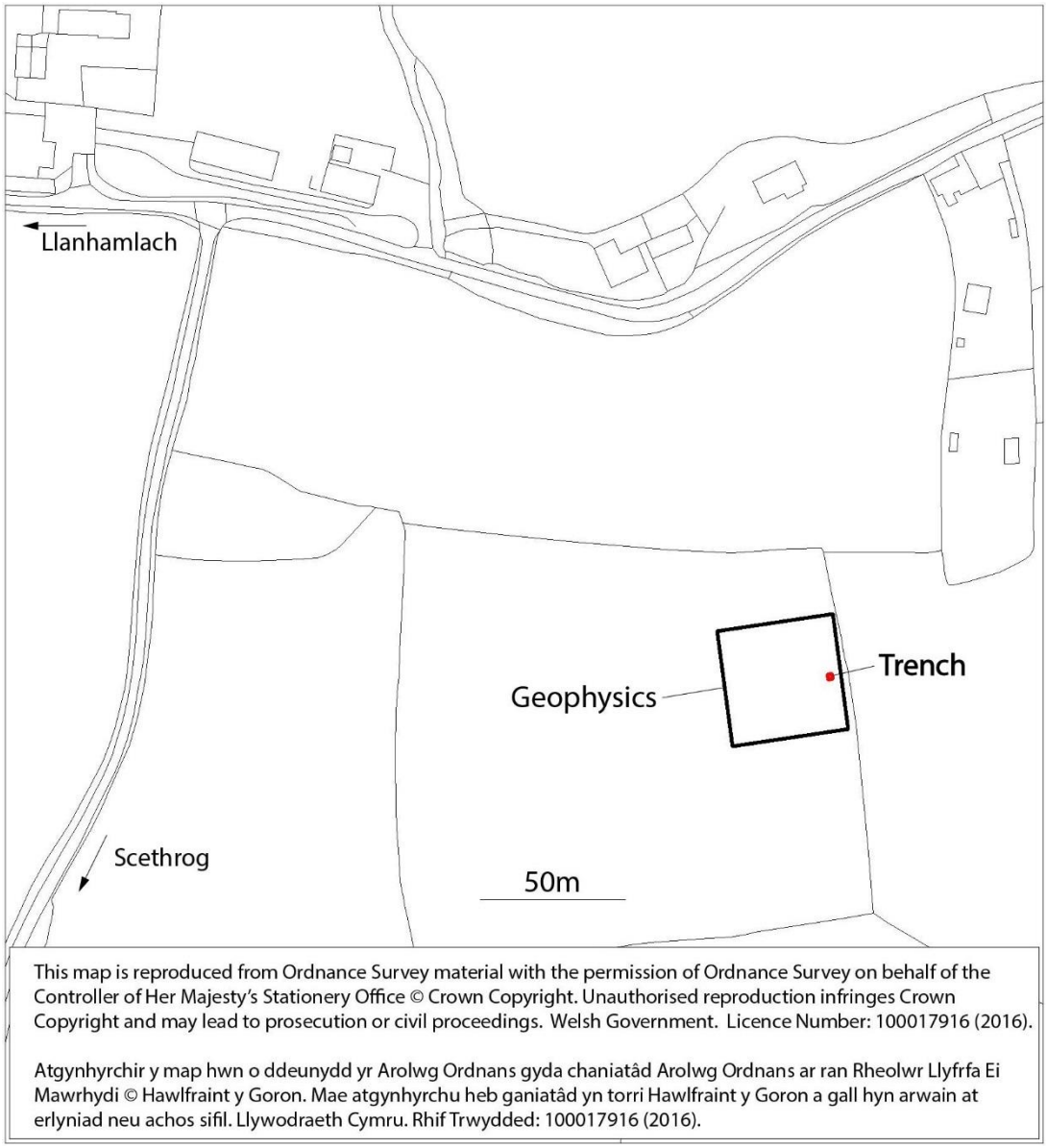

Fig. 2: Location of the geophysics and excavation

2 Geophysical Survey

2.1. The survey was conducted with a Bartington 601 fluxgate gradiometer with two sensors. The readings in each grid were taken along traverses 0.5m apart and the speed of each traverse was carefully controlled such that readings were taken every 0.25m, giving a total of 3200 readings per 20m-square grid. The readings were processed using Archeosurveyor software to provide a greyscale image of the results; the only processing functions used on the greyscale image were *Destripe* to remove variations in the readings between opposing traverses and *Clip*, to remove the effects of very high and very low readings on the results, thereby allowing anomalies of potential archaeological interest to be observed.

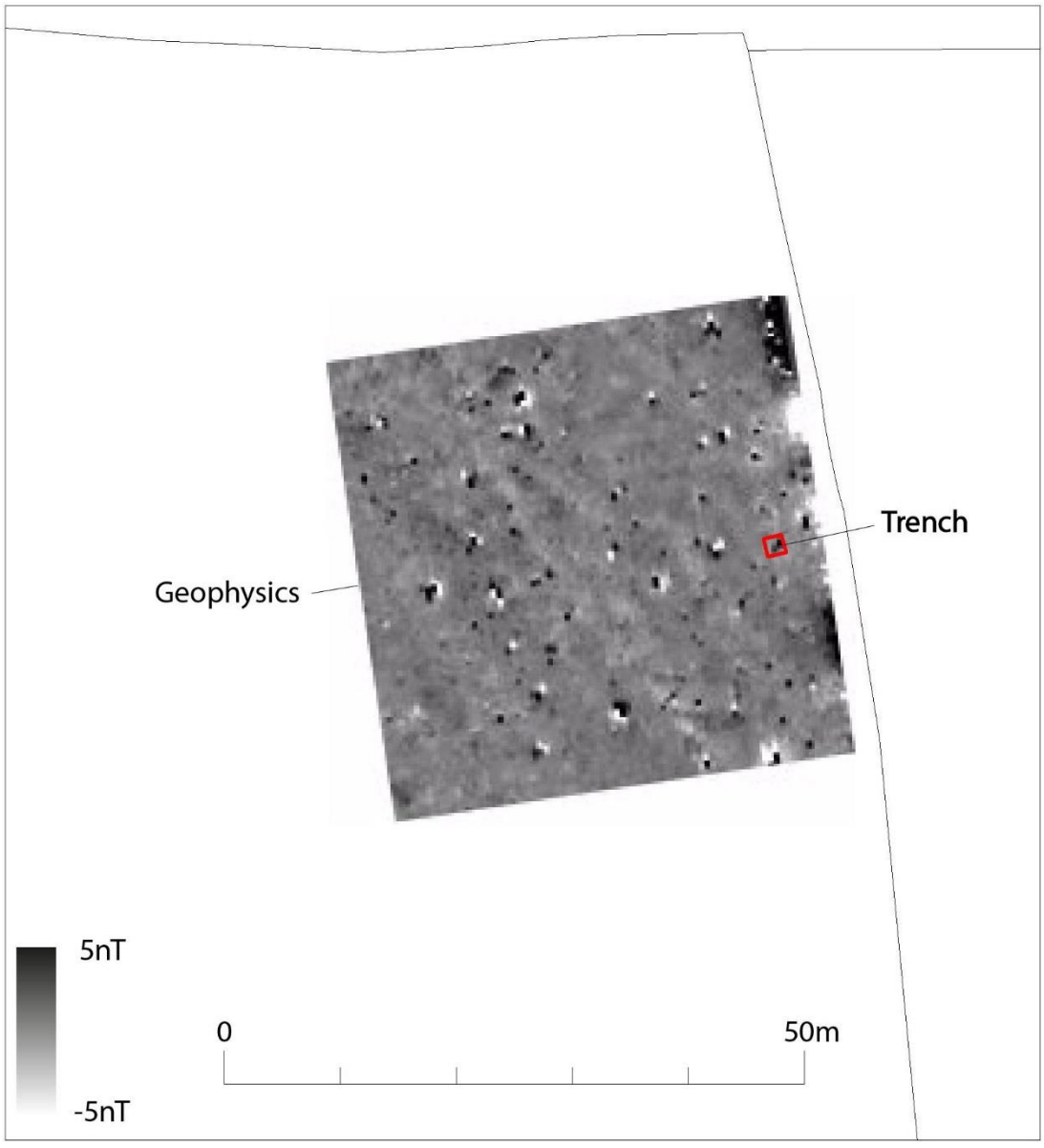

Fig. 3: Geophysics results compared to the excavation

2.2. The find location was identified by the finder prior to the commencement of work to allow the survey to be appropriately located. Four 20m-square grids were laid out by taped measurement to form a square measuring 40m by 40m. The survey area was

aligned with the adjacent fence to allow maximum coverage of the location and this is confirmed by the results, which show the background magnetism associated with the fence masking the results of a narrow strip along the eastern edge of the surveyed area. The area was then located in relation to local field boundaries by total station survey, which allowed the survey results to be overlaid on the modern Ordnance Survey mapping, thereby enabling the co-ordinates of any significant anomalies to be determined and the results compared to the position from which the knife was recovered.

2.3. The results (Figs 3 and 4) showed no evidence for any feature suggestive of a ring-ditch, as all that was visible were a series of small anomalies, most of which were no doubt related to iron objects in the ploughsoil. That said, a small number of discrete anomalies, nowhere more than about 1.0m in diameter, can be seen in the results and it is possible that some of these might represent pits. One anomaly of the same type matched the position from which the knife was recovered, but this may owe its appearance in the results to the disturbance of the soil by the detectorist's excavation.

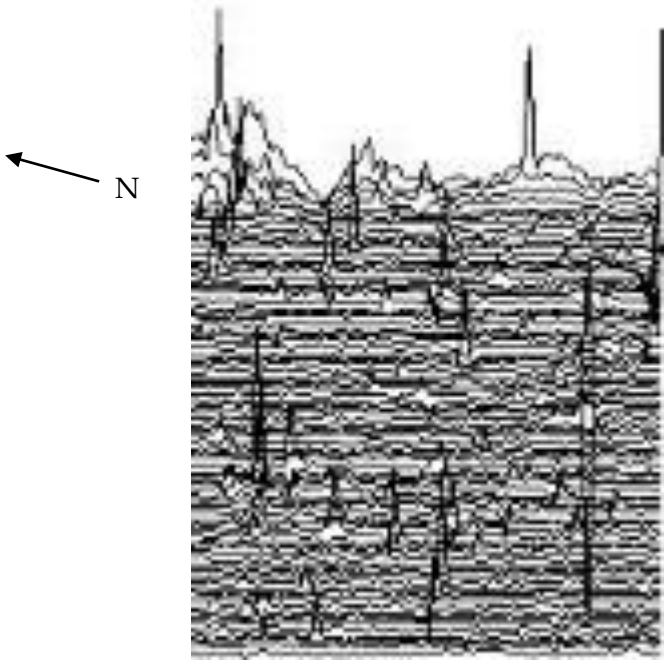

Fig. 4: Trace plot of the geophysics results. Originally scaled at 25nT/cm

2.4. It is perhaps also significant, in the light of past geophysical surveys, that the local soils are reddish silts ultimately derived from the Old Red Sandstone rocks of the Beacons. Where strongly magnetic features or layers are absent the results from these soils have often proved to be poor, or at best patchy, presumably owing to there being little difference between the background magnetism of the natural subsoil and that of the topsoil. As a result, the lack of identified archaeological features cannot necessarily be taken to mean that none exist.

3 Excavation

3.1. The trench was excavated entirely by hand and covered an area measuring 1.6m north/south by 1.6m east/west, centred on the position from which the knife was recovered.

3.2. This revealed a small sub-circular pit (3) cut into the natural pinkish-red clay silt subsoil (2). The pit measured 0.50m east/west by 0.45m north/south and survived to a depth of 0.16m (see Fig. 5). The pit contained the remains of a pottery vessel holding a cremation (6). A fragment of cremated bone provided a radiocarbon date of 1740-1620 cal BC (SUERC-72134).

3.3. An initial assessment of the vessel by Frances Lynch, prior to conservation, suggested this was a Food Vessel of Bronze Age date. The pot survived to a height of 0.15m but its top part had been truncated by subsequent plough action, suggesting it had originally been perhaps 0.20m high; the diameter of the base was about 0.10m, increasing to a maximum of 0.35m, just below the point where it had been truncated.

Fig. 5: The pit (3) revealed by the excavation, from the south. CPAT 4270-0022

3.4. The vessel (Fig. 7) was set in an upright position in the base of the pit. It was evident that placement of the cremation within the vessel was done in more than one stage, as it was possible to identify the position within the deposit from which the knife had been recovered, which was 0.10m above the base of the vessel. A small bronze pin was also recovered from this location, perhaps 10mm lower in the deposit. The bronze artefacts were sealed within the vessel by a further deposit of cremated bone, but any further information was lost owing to the truncation of the pot by subsequent plough action. To allow for some assessment of potential changes in the placement of the *in-situ* material, the cremation was removed in three layers, each 50mm thick, and these were kept separate for analysis.

Fig. 6: The cremation deposit as exposed at the base of the ploughsoil, viewed from the south, showing the excavation (7) by the metal detectorist who found the bronze knife. The knife was recovered from the crescent-shaped shelf at the centre of the image and not the base of the hole to the left. CPAT 4270-0009

Fig. 7: The remains of the vessel following the removal of the cremation, viewed from the south. CPAT 4270-0018

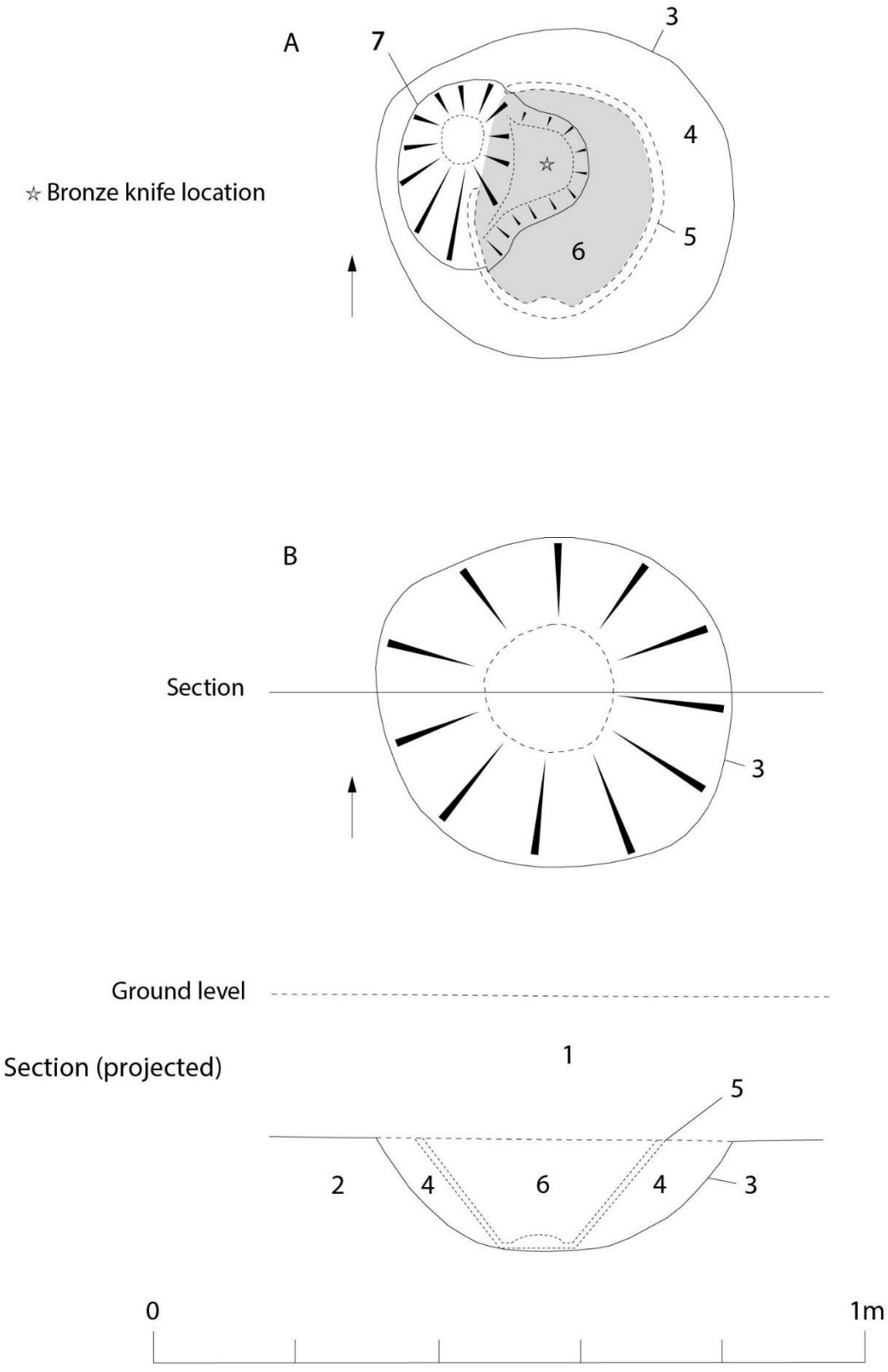

Fig. 8: Plan and section of the cremation burial. A – pre-excavation; B – post-excavation

3.5. It seems likely that the pot was filled with the cremation to a level above that which survived owing to two pieces of additional evidence. Firstly, faint traces of bone were apparent in the pinkish-grey silt fill (4) of the pit outside the pot, pointing to some spillage of the cremation. Secondly, significant quantities of additional calcined bone, fragments of pottery from the vessel, and a broken flint object were recovered from a 'tail' of material in the overlying reddish-brown sandy silt ploughsoil (1), here 0.20m thick. The 'tail' covered an area to the south of the pit measuring about 0.40m north/south by 0.25m east/west and 0.07m high and it was clear that this represented parts of the cremation deposit that had been disturbed by the action of the plough following its deposition; when analysed, some of the bone in the ploughsoil was found to join with fragments from the cremation. The flint object (Fig. 10) is also likely to have been placed within the pot, although at a higher level in the deposit than the bronze knife and pin. The most recent feature in the trench was the hole (7) dug by the metal detectorist when the knife was recovered.

Fig. 9: The 'tail' of material in the ploughsoil that had originated from the cremation burial, viewed from the south. CPAT 4270-0005

4 Flint

4.1. A single piece of worked flint showing areas of retouch was recovered from the 'tail' of material that was identified in the ploughsoil (see Fig. 9). This had clearly been broken and was closely intermixed with fragments of cremated bone and was therefore almost certainly displaced by ploughing from within the cremation vessel. No evidence was noted that suggested the flint had been exposed to heat on the pyre and it is most likely to have been placed deliberately within the vessel along with the bronze objects, presumably near the top of the cremation.

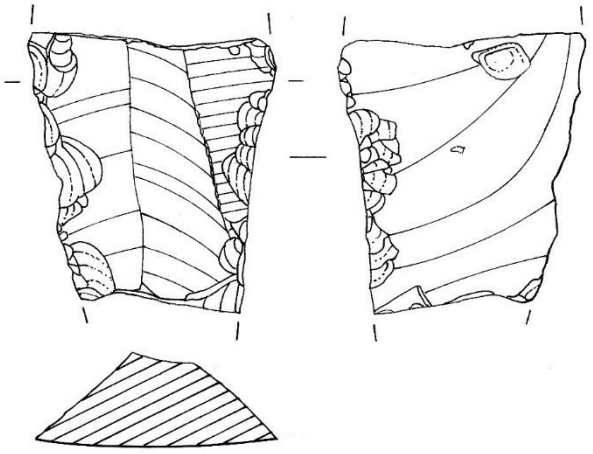

Fig. 10: The worked flint object, scale 2:1.

5 Summary of the cremation deposit analysis

5.1. The cremation deposit was collected in three samples, each covering a thickness of 50mm of material within the pottery vessel, as noted above. These, together with other material from the cremation that had been disturbed, either by the plough or by the excavation of the bronze knife at the time of its discovery, were forwarded to Archaeological Services Durham University for analysis (see Appendix 4).

5.2. About one-third of the total weight of bone was identifiable, from which the analysis revealed that the cremation was of an adult, possible male, who was probably more than 25 years old at the time of death. There was no duplication of bones and no marked age-related variation in bone size or development, which indicated that the cremation was likely to have been of a single individual. The person had suffered joint disease in the neck vertebrae, and various other spinal and extra-spinal joints held clues that could be associated with degeneration of the joints. Evidence of soft tissue trauma to the *soleus* muscle of the right calf and a dental abscess or cyst were also identified; all parts of the body were represented in the cremation.

5.3. There appeared to be some pattern to the deposition of the cremation within the pottery vessel, with the analysis suggesting that the bones of the upper and lower limbs, and torso may have been preferentially, though not exclusively, placed into the urn first, with bone from the skull tending to be placed on top. The bronze objects appeared to have been placed in the vessel before most of the skull fragments were added.

5.4. The weight of bone recovered from Scethrog (1555.6g), even following truncation and the presumed loss of an unknown quantity of bone, was certainly comparable with that produced during modern cremations and the amount found in primary barrow burials, and was potentially consistent with a larger cremation burial from within a Bronze Age cemetery. It appeared that the cremated bone may have been collected by hand and the quantity placed in the vessel suggests that this was done with care.

5.5. The colour of the cremated bone at Scethrog indicated that the bone had been exposed to temperatures over ~600°C in an oxygenated environment, which confirmed that enough fuel was collected to enable the pyre to burn at high temperatures for a sufficient length of time for full oxidation of the bone to occur. It also indicated favourable weather conditions, since rain and high winds can hamper successful cremation. Overall, this suggests the community had access to adequate supplies of suitable fuel, as well as the necessary skills and knowledge to construct and tend a pyre successfully.

5.6. Very small amounts of charcoal, thought to represent fuelwood for the cremation, were identified, comprising oak, field maple and probably willow. Two charred barley grains from the lowest part of the cremation may represent food offerings burnt on the pyre, or the remains of ritual feasting associated with the funerary process. It was not possible to identify any evidence regarding the time of year when the cremation took place.

5.7. A similarly small amount of animal bone, possibly all from the same bone, was recovered and identified as belonging to a mammal; greater precision was not possible. Evidence from similar cremations suggests that included animal bone was probably derived from food offerings, but that the animals could also have been pets or working animals. When only one or two fragments of animal bone are present (as at Scethrog) their inclusion may have been either deliberate, as token inclusions of part of the animal, or accidental, owing to misidentification of animal bone as human.

5.8. Typically during the Bronze Age, pyre goods which were burnt on the pyre with the body, were more common than grave goods that were placed in the grave at the time of burial but not burnt on the pyre (see Appendix 4, 4.31). As such, it is interesting that the Scethrog objects appear to fall within the latter category.

6 Radiocarbon Dating

6.1. A single fragment of cremated bone was selected by Archaeological Services, Durham University, and sent to SUERC for AMS dating. The date was calibrated using OxCal 4.2.4 (Bronk Ramsey 2009) and the IntCal13 atmospheric curve (Reimer *et al.* 2013). It is quoted in the form recommended by Mook (1986), with the end points rounded outwards to the nearest 10 years.

SUERC-72134

Material: cremated bone

Conventional radiocarbon age: 3373±29 BP

Calibrated results at 95.4% probability: 1750-1610 BC

7 Conclusions

7.1. The archaeological investigations have clarified the nature of the site at Scethrog, which comprised a discrete human cremation placed within a pottery vessel, together with a bronze knife, bronze pin and a worked flint tool, which were presumably intended as grave goods. The presence of two items of associated prehistoric metalwork means that all material, except the cremated bone, is likely to be deemed treasure under the 1996 Treasure Act, and this has been reported to the coroner for the district.

7.2. The pottery vessel had been placed within a small pit at the time of the cremation; at present it is considered to be a Vase Food Vessel, although its current fragility means that final identification must await its conservation. Lynch (2000, 117-8), however, notes that these are accessory vessels rather than containers, unlike the larger Food Vessel Urn which was often used for cremations. The Scethrog vessel also lies at the upper end of the Vase Food Vessel size range so there must remain some uncertainty over attribution. Its appearance is akin to a Food Vessel Urn from Trelystan, near Welshpool, which contained a double cremation (Britnell 1982, 153-5 and 167-8) and it is reasonable to assume that whatever its type, it belongs to the Early Bronze Age. The top of the vessel, including its rim, was subsequently lost to the action of the plough, which spread some of the cremation and associated material through the ploughsoil.

7.3. The results of the specialist analysis of the cremated bone suggest that the cremation is potentially of an adult male over 25 years of age, who had suffered from some degree of joint disease during life. Evidence of a probable dental abscess and soft tissue damage to the right calf muscle was also identified. The analysis also suggested that the bones of the upper and lower limbs, and torso may have been preferentially, though not exclusively, placed into the urn first, with bone from the skull tending to be placed on top. The bronze objects therefore appeared to have been placed in the vessel before most of the skull fragments were added; the flint may have been placed on top of the cremation.

7.4. The weight of bone recovered from Scethrog was comparable with that produced during modern cremations and with the amounts found in primary barrow burials; it was potentially consistent with a larger cremation burial from within a Bronze Age cemetery. Various strands of evidence suggested that the cremated bone may have been collected by hand and the quantity placed in the vessel suggests that this was done with care. The condition of the bone implies the community had access to adequate supplies of suitable fuel, as well as the necessary skills and knowledge to construct and tend a pyre successfully.

7.5. Very small amounts of possible fuel for the pyre were recovered from the cremation, comprising oak, field maple and probably willow. Two charred barley grains from the near the base of the pottery vessel may represent food offerings burnt on the pyre, or the remains of ritual feasting associated with the funerary process; this may be supported by the presence of a similarly small amount of mammal bone, but it cannot be confirmed that this represents a food offering. It was not possible to identify any evidence regarding the time of year when the cremation took place.

7.6. The radiocarbon determination of 1750 - 1610 cal BC for the fragment of bone from the cremation deposit places the burial towards the end of the Early Bronze Age. This fits reasonably well with the proposed dating of the bronze knife, for which Gwilt and Mumford's assessment (Appendix 2) had suggested a date of 1950 - 1500 BC was most likely on typological grounds.

7.7. What seems to have been a knife comparable to that recorded here, and also apparently associated with human remains, is recorded in the Glamorgan-Gwent Historic Environment Record as having been found in 1908 at a cairn on Cefn Cilsanws, only 18km to the south-south-west (see also Roese 1979, 31 and 41). While the placing of cremation burials within cairns or earthen mounds is well-known, a brief review of some sites equivalent to Scethrog indicates that cremations in this period were also sometimes placed in pits forming parts of what were effectively small cemeteries.

7.8. In recent years a cemetery of this type was found during work associated with the South Wales Gas Pipeline at Cwm Camlais, 10km west of Brecon (CPAT PRN 131206). This covered an area measuring approximately 20m by 10m, with no evidence of a surrounding enclosure ditch. Two clusters of pits were identified, some stone lined and many containing calcined bone. Dates of 1880-1650 cal BC and 1650-1460 cal BC were obtained from charred material in two of the cremation pits; these broadly cover the date obtained from Scethrog and it might be suggested that this hints at the development of a local or regional trend in burial practices. Typically during the Bronze Age, pyre goods, which were burnt on the pyre with the body were more common than grave goods that were placed in the grave at the time of burial (see Appendix 4, 4.31). As such, it is interesting that the Scethrog objects appear to fall within the latter category and while this may simply have been a matter of personal preference it could also support the idea of a local or regional trend in burial practice.

7.9. A number of cremation burials, both within and without covering barrows, were identified in the detailed excavations carried out at Trelystan, near Welshpool. There, Britnell (1982, 133) notes that 'The earliest burials, which consist of cremations in pits, and occasionally accompanied by a Food Vessel, were covered by separate small mounds of stone or turf, or a combination of the two'. At Trelystan, it was the later cremations that were associated with barrows. On balance, it seems possible that the Scethrog cremation would have had a covering mound of some kind, but its small size and the nature of subsequent land-use means that no trace of any mound that may once have existed can now be identified; nothing to suggest the presence of one was evident in the geophysics results and the degree to which the ground slopes makes a large mound less likely.

7.10. Somewhat further afield, a group of small pits, containing cremations associated with pottery vessels of the Early Bronze Age, although here the vessels were inverted, was revealed during works on the A55 trunk road at Cefn Cwmwd, Rhostrehwfa, Anglesey (Cuttler *et al* 2012, 33-36). Grave goods, in the form of a jet object and a faience bead were identified, and dates of 2140-1740 cal BC and 1890-1520 cal BC were obtained. Perhaps the similarities with Cwm Camlais are therefore indicative of a more general trend in Early Bronze Age burial practices, with the variations owing to local preferences. Another possible factor could be that in areas with relatively indistinct topography, features which led to the siting of cemeteries were

rather more ephemeral and cannot now be identified in the landscape. Burrow (2011, 111), referring to this period, summarises the situation by stating that '…the remains of many people were probably interred in open cemeteries with no obvious mound above them. Such sites are hard for archaeologists to locate and are easily damaged by ploughing or land development'.

8 Acknowledgements

8.1. The writer would like to thank the landowner, Richard Roderick of Newton Farm for permission to carry out the work and Tom Haines, the metal detectorist who found the bronze knife, for his cooperation and interest.

8.2. Thanks are also due to Nigel Blackamore of Brecknock Museum; Adam Gwilt and Louise Mumford of Amgueddfa Cymru - National Museum Wales; and Jeff Spencer, Ian Davies and Rachael Matthews, CPAT.

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Cartographic

1887 Ordnance Survey first edition 1:2500 map, Breconshire 34.03

1904 Ordnance Survey second edition 1:2500 map, Breconshire 34.03

1983 Soil Survey of England and Wales map and legend for the 1:250,000 map of England and Wales: Sheet 2 (Wales)

1994 British Geological Survey map of Wales (Solid edition)

10 Archive deposition Statement

10.1. The project archive has been prepared according to the CPAT Archive Policy and in line with the CIfA *Standard and guidance for the creation, compilation, transfer and deposition of archaeological archives guidance* (2014). The archive currently remains with CPAT, awaiting the outcome of the Coroner's findings on whether the material associated with the burial constitutes treasure. A summary of the archive is provided in Appendix 1.

10.2. The archive will be deposited with the regional Historic Environment Record, maintained by CPAT in Welshpool, while it is expected that a decision on the deposition of the artefacts will be forthcoming following the coroner's deliberations; these are currently held by Amgueddfa Cymru - National Museum Wales in Cardiff.

Appendix 1: Site Archive

CPAT Event PRN: 140140

Geophysical survey data - Archeosurveyor compatible

Topographical survey – Penmap/ DXF

2 A4 drawings at 1:10 scale

Drawings register

8 context record forms

Context register

23 digital photographs, CPAT Film No 4270

Photographic register

1 finds and samples record form

Appendix 2: National Museum Wales assessment

Provisional investigation and identification of bronze knife discovered by Tom Haines, in association with human bone in Talybont-on-Usk Community, Powys (approx. SO 108 257)

Adam Gwilt & Louise Mumford

Introduction

The artefact was couriered to the National Museum Cardiff on Tuesday 1st November specifically to permit its identification and recording, with the helpful input and support of Nigel Blackamore, Senior Curator of Brecknock Museum. This was undertaken following prior consultation and agreement with Jeff Spencer, HER Manager at CPAT on 31st October. Rapid feedback of information about the dagger could helpfully inform the intended archaeological investigation of the find-spot by CPAT staff in mid-November, and subject to emergency funding for excavation and survey via Cadw being secured.

On Monday 31st October, the finder was contacted and permission was obtained for limited conservation surface cleaning of the dagger, specifically in order to aid its accurate identification.

Limited conservation cleaning & microscope examination

On 1st and 2nd November surface soil covering small areas of the blade edge and parts of the hilt end of the object was carefully removed specifically to: 1. Clarify the shape of the interface of the hilt with the blade and 2. To clarify the presence or absence of blade bevels and grooves on the artefact. In addition, the surfaces of the artefact and the soil deposits adhering to artefact were carefully examined under microscope for any additional evidences relating to the use and burial of the object.

Observations

1. There were no blade bevels discernible and the artefact does not have grooves along the blade surfaces (see below for typological significance).

2. Striations were observed over the cleaned areas of upper blade. These were parallel with the long axis of the blade and suggest preparation and sharpening of the blade for use.

3. On the hilt end, a small area of bent bronze was observed adjacent to one of the rivet holes, suggesting the hilt end had been damaged, either during use, or prior to burial.

4. Across one surface of the artefact, small specks of white bone were observed within the soil adhering. Towards the tip end of the object, a larger fragment of porous bone was observed. This provides strong evidence in support of the association of the knife with a cremation burial.

5. Along the hilt end, there is a differentially darker and duller surface patination extending across the rivet end of the hilt. This was probably created through surface

juxtaposition with the original hilt, made of an organic material such as bone, wood or horn. The shape of the interface between hilt and upper blade appears to be either straight or slightly curved and there is no clear evidence for a hilt with an omega shaped hilt. The upper blade striations are absent over the area once covered by the original hilt.

6. On one hilt face, a small area of mineral replaced corrosion deposit survives, preserving the structure of the original organic hilt. Its laminated and layered structure under microscope suggests that the hilt was once made of horn. The corrosion deposit has a straight or slightly curved upper blade margin, corresponding with the edge of the darker area of hilt patination. This suggests that the corrosion represents a distinct edge of the hilt.

Preliminary Description and Identification

Knife – Series 7, probable Sub-type 7C

Dimensions: length 105.3mm; maximum width 39.8mm; maximum thickness 4.2mm; diameter of rivet-holes approx. 3.5-4.0mm; weight before cleaning 35.7g.

Virtually complete copper alloy knife of slender and triangular form. Shallow and broad hilt-plate with array of three rivet-holes, with blade widest at intersection with hilt-plate. The blade has a lozenge shaped cross-section as a diagnostic feature, with thinner blade margins, but no blade bevels. Selective cleaning of the hilt-end has revealed evidence for a hilt with a straight or slightly concave edge, as indicated by a remnant mineralised hilt fragment of probable horn and an area of darker patination once covered by the organic hilt. The sides of the knife are slightly concave, tapering evenly down the length of the blade to a narrow pointed tip. Adjacent to one rivet hole on the hilt is a small area of bent hilt edge, suggesting damage to the hilt during use or prior to burial. The metal surfaces are heavily pitted and have a green patination, while the hilt end has a dark grey-green patina.

The soil adhering to one surface of the knife has small white bone inclusions. A larger bone fragment towards the tip end has a visibly porous bone structure.

Identification

This may be identified as a Series 7 knife – a small blade with a riveted-butt. Its lozengic shaped blade cross-section suggests that it probably equates to a Sub-series 7C knife with a thickened blade (Needham 2015, 24-5 & Appendix I, 12-14). This may be correlated with flat-rivetted knife-daggers, as historically defined by Gerloff (1975, 161-8, Cats. 240A-302, Pls. 23-5). The knife, at 105.3mm long, is at the upper end of the knife range, though smaller than most daggers, which tend to be over 125mm long. The absence of an omega shaped hilt, and its straight or slightly curved edge, however, differentiates it from the larger daggers. Further typologically distinctive characteristics, identifying it to this series and sub-type is the shallow and broad hilt plate, the triangular slender blade and the blade being widest where it meets the hilt plate. The three rivet array on the hilt is also consistent with many Sub-series 7C

knives (Needham 2015, Appendix 1, 12-3). The absence of a tang, grooves or a central blade-rib on this knife also help to identify it to specific type.

Knives of 7C type commonly date to Periods 3 and 4 of the mature Early Bronze Age and with a date range spanning 1950-1500 BC, however there is some evidence that they may have emerged during Period 2 of the Early Bronze Age (2200-1950 BC), making a slightly earlier date a possibility (Needham 2015, Appendix 1, 14). This chronology, probably during the mature Early Bronze Age, is consistent with a cremation burial association, which is now strongly suggested by the flecks of white bone found adhering to the surface of the knife. The survival of a mineralised replaced fragment of hilt on this knife, probably of bone, is unusual and adds importantly to the small number of daggers with hilt preservation and organic dagger pommels known from Wales. Obtaining radiocarbon dating evidence from the cremated bone in this grave would yield important new dating evidence for bronze knives of the mature Early Bronze Age (and any associated grave goods later discovered), in a wider British context.

Many cremation graves containing knives or flat-rivetted knife-daggers have contained a range of further grave-good associations (Gerloff 1975, 161-8, Cats. 240A-302). It is possible to anticipate that this grave might contain a Food Vessel, Collared Urn, Cordoned Urn or Cup, a range of lithic or bone tools and weapons or items of adornment of stone, bone or amber. In Wales, bronze knives have been found in association with a late beaker at Pentraeth, Anglesey, a Food-vessel Urn at Penmaenmawr Mountain, Conwy, with a Collared Urn at Ffestiniog, Gwynedd and in a secondary cremation with Cup at Llandow, Vale of Glamorgan (Gerloff 1975, 162-3, Cats. 250-1 & 263; Savory 1980, 53). If a further metal artefact or artefacts were to be found in this grave in the Community of Talybont-on-Usk, Powys, then the whole grave group would also need to be reported as a treasure case in Wales.

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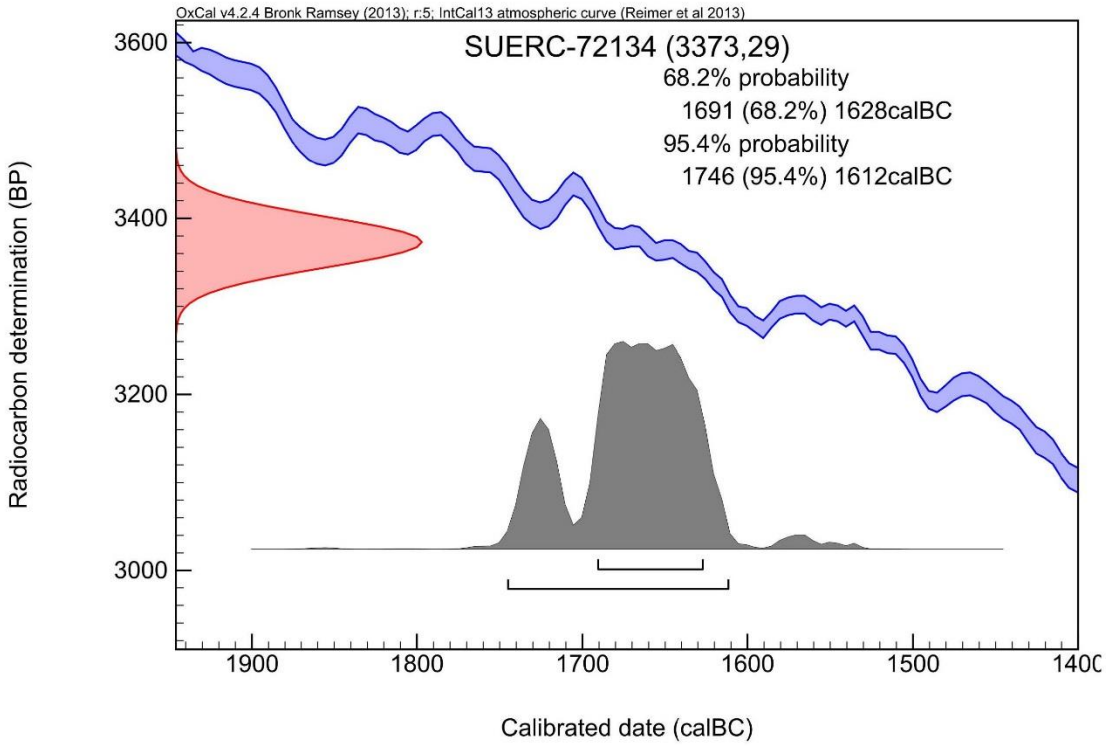
AG & LM 04.11.16

Appendix 3: Radiocarbon Determination

The following result was obtained from a sample of calcined bone within the cremation deposit, at a level equivalent to that from which the bronze knife was recovered.

Calibration Plot



Appendix 4: Palaeoenvironmental assessment and human bone analysis

Archaeological Services Durham University Report No. 4424

Contents

1. Summary

The project

1.1 This report presents the results of analysis of a Bronze Age cremation excavated at Scethrog, Powys, Wales.

1.2 The works were commissioned by the Clwyd-Powys Archaeological Trust (CPAT), and conducted by Archaeological Services Durham University.

Results

1.3 Very small fragments of oak, field maple and cf. willow family charcoal were recovered from the fills, which may reflect remnants of the fuelwood used for the cremation. Two charred barley grains from the lowest excavated spit may represent food offerings burnt on the pyre, or the remains of ritual feasting associated with the funerary process.

1.4 All of the bone was well preserved. The remains were tentatively identified as those of an adult potential male, who had suffered joint disease, soft tissue trauma, and a dental abscess during life. It appeared there was some order to the deposition of the bone within the urn. The identified bone fragments included various parts of the skull, spine, ribs, shoulders, arms, hands, pelvis, legs and feet, so all parts of the body were represented.

2. Project background

Location and background

2.1 An excavation of a Bronze Age urned cremation burial was conducted by CPAT at Scethrog, Powys, Wales. This report presents the results of analysis of human bone from three 5cm spits excavated from the fill of the pot [context 6], and within disturbed material from the ploughsoil [context 1]. Palaeoenvironmental assessment was undertaken on the soil matrix of the burial.

Objective

2.2 The objective of the scheme of works was to analyse the human bone fragments and examine the soil matrix for additional palaeoenvironmental remains.

Dates

2.3 Samples were received by Archaeological Services on 5th December 2016. Analysis and report preparation was conducted between December 2016 and April 2017.

Personnel

2.4 Human bone analysis was by Dr Anwen Caffell. Soil processing and palaeoenvironmental assessment were conducted by Dr Charlotte O'Brien. The small fragments of potential animal bone were examined by Dr Carrie Armstrong.

Archive

2.5 The bone samples and flots are currently held in the Palaeoenvironmental Laboratory at Archaeological Services Durham University awaiting collection. The charred plant remains will be retained at Archaeological Services Durham University.

3. Palaeoenvironmental assessment

Methods

3.1 The samples of context [1] and [6] were manually floated and sieved through a 500µm mesh with the bone fragments carefully brushed clean. The residues were examined for small bones, shells, fruitstones, nutshells, charcoal, pottery, flint and other artefacts. The flots were examined at up to x60 magnification for charred and waterlogged botanical remains using a Leica MZ7.5 stereomicroscope. Identification of these was undertaken by comparison with modern reference material held in the Palaeoenvironmental Laboratory at Archaeological Services Durham University. Plant nomenclature follows Stace (2010). Habitat classifications follow Preston et al. (2002).

3.2 Charcoal fragments were identified by examining the transverse, radial and tangential sections at up to x600 magnification using a Leica DMLM microscope. Identifications were assisted by the descriptions of Schweingruber (1990) and Hather (2000), and modern reference material held in the Palaeoenvironmental Laboratory at Archaeological Services Durham University.

3.3 The works were undertaken in accordance with the palaeoenvironmental research aims and objectives outlined in the regional archaeological research framework and resource agendas (Caseldine 2013; Huntley 2010).

Results

3.4 Charred palaeoenvironmental remains were sparse. A few very small fragments of charcoal were present in the three excavated spits. In the upper spit, these consisted of six small fragments of oak stemwood with tyloses and radial cracks. A tiny fragment of field maple charcoal was recorded in the middle spit. The single fragment in the lower spit was too small for certain identification, but appeared to be a member of the willow family. The only charred plant macrofossils were two barley grains in the lower spit.

3.5 Roots were noted in all of the samples, and modern straw/chaff occurred in the upper spit and the sample from the ploughsoil. Other uncharred remains included seeds of fumitories, redshank, goosefoots, sun spurge and black-bindweed which are weeds of disturbed and cultivated land, and are also probably modern intrusions. A few fragments of the pottery vessel were recovered from all of the samples. The results are presented in Appendix 1.

Discussion

3.6 The small charcoal fragments may derive from fuel associated with the cremation. Oak, in particular, has frequently been recorded in Bronze Age cremation deposits, and is believed to have been selected as it allows the high temperatures necessary for the cremation process (O'Donnell 2007). However, the small size of the charcoal fragments could have enabled them to enter the burial context through bioturbation or water percolation.

3.7 The two barley grains in the lower spit of context [6] were in relatively good condition suggesting little post-depositional movement. These may represent food offerings burnt on the pyre (McKinley 2006), or the remains of ritual feasting associated with the funerary process.

4. Human bone analysis

Methods

4.1 The cremated bone was passed through a stack of sieves with mesh sizes of 10mm, 5mm and 2mm, and the length of the longest fragment was recorded with digital callipers (McKinley 2004a). All bone fragments were examined and identifiable fragments were grouped according to the following categories: skull, axial (spine and ribs), upper limb, and lower limb. The overall weight for each category was recorded, and the identifiable fragments were catalogued in detail (Appendix 2). The minimum number of individuals present was calculated, and any features that might assist with estimating the age or sex were recorded. Finally, any manifestations of pathological conditions were noted.

Results

4.2 A summary of the data on the cremated remains is presented in Appendix 3.

Preservation

4.3 All the bone was well preserved, being hard and with minimal erosion of the broken edges. The bone was brittle, and some warping and twisting of the bone was observed, along with cracking and fissuring.

Weight

4.4 The total weight of bone recovered from all spits and contexts was 1555.6g (see Table 1), which correlates well with the amount of bone expected from a modern adult cremation burial (average 1625.9g, range 1001.5-2422.5g, McKinley 1993). The bulk of the cremated bone was recovered from within the urn, particularly the upper and middle spits (Table 2). Over 100g of bone was recovered from the surrounding ploughsoil, and just over 70g of bone had been collected by the metal detectorist and passed to Brecon Museum.

Fragmentation

4.5 The weights of bone and maximum fragment size in each sieved fraction are shown in Table 2. The largest fragment measured 73.9mm in size and the largest proportion of bone was over 10mm; less than a fifth was in the 2mm sieved fraction. Most of the bone collected by the metal detectorist and handed to the museum was over 10mm in size, and only 2.3% was in the 2mm sieved fraction, which is not surprising as larger fragments are easier to gather. The bone from the ploughsoil was most fragmented, with less than a third of the weight in the 10mm sieved fraction and the bulk of the bone in the 5mm sieved fraction. The largest fragment among the ploughsoil bone was 36.5mm in length, which was over 10mm smaller than the maximum fragment size present in all other layers. The bone from within the urn tended to be less fragmented, particularly the middle and upper layers which contained the bulk of the material. Over half the weight of bone from the middle layer was over 10mm in size and this layer contained the largest fragment. The lower layer contained more fragmented bone than the other two layers.

Bone colour

4.6 The colour of cremated bone is related to the degree of oxidation achieved, and this in turn will be related to the temperature attained, the length of time the body was on the pyre, and the amount of oxygen available (McKinley 2004a; 2000b). Almost all the bone from the Scethrog cremation burial was predominantly buff/ white in colour, although occasional areas of pale grey or mid-to-dark grey were present (see Table 1). This indicates that almost all the bone had achieved full oxidation with complete loss of the organic components, suggesting it had been burnt at temperatures of over ~600^{o}C with plenty of oxygen for a sufficient length of time. The areas of grey indicated that some parts of a small number of bone fragments had failed to achieve full oxidation. They may have been exposed to reducing conditions (due to a lack of oxygen availability), or been exposed to cooler temperatures. However, since the majority of the bone was fully oxidised, it seems likely that cooler temperatures and/ or lack of oxygen were restricted to small localised areas within the pyre.

Identification of fragments

4.7 Definite fragments of human bone were present in all layers of the urn as well as in the bone delivered to Brecon Museum and recovered from the ploughsoil. Many of the fragments examined could be joined together with other fragments, particularly within the same layer/ context. However, joins were also found across layers and contexts. Joins were found between fragments from the lower layer within the urn and fragments from the middle layer, while fragments from the middle layer joined with fragments from both the lower and upper layers. Fragments from the upper layer joined with fragments from the middle layer as well as with fragments handed in to the museum, and one potential join was found with a fragment of bone from the ploughsoil. One fragment from the museum joined to a fragment of bone from the ploughsoil. It seems highly likely that the bone recovered from the ploughsoil did originate within the cremation burial.

4.8 Nearly a third of the overall bone could be identified (Table 3). Most of this identified bone either derived from the skull or the lower limb, with less than 10% of the identified bone belonging to the axial skeleton. The average proportion of bone in each of the four categories among the undisturbed lidded urned burials at Brougham is given here for comparison, with the range in brackets: skull 18% (15-23%); axial 18% (6-30%); upper limb 24% (21-28%); and lower limb 40% (31-53%; McKinley 2004b: 300). This indicates that while the proportion of lower limb bones at Scethrog is fairly typical, the proportion of skull bones is high, and the proportion of upper limb and axial bones is low. Unsurprisingly, the layers and contexts containing the least-fragmented bone contained a higher proportion of identifiable fragments, with the lowest proportion of identifiable fragments present in the lowest layer of the urn and the ploughsoil where fragmentation was greater.

4.9 There did appear to be some patterning to the deposition of the bone within the urn. Fragments from the lower limb made up a fairly large proportion of the bone from most layers and contexts, typically between 41-45%, but they only made up a third of the weight of identified bone from the upper layer. Fragments of skull were particularly common in the upper layer of the urn (where they comprised 59% of the weight of identifiable bone) and among the bone delivered to the museum; they also made up over a third of the weight of bone from the ploughsoil. In contrast, skull fragments only comprised around a fifth of the weight of identified bone from the middle and lower layers. Bone from the axial skeleton (vertebrae and ribs) was most common in the lowest layer of the urn, followed by the middle layer. Bones from the upper limb were also more frequent in the middle and lower layers, as well as in the ploughsoil, but least common in the upper layer of the urn. There is therefore some suggestion that the bones of the upper and lower limbs, and torso may have preferentially been placed into the urn first, with bone from the skull tending to be placed on top, although this is not an absolute distinction. A detailed catalogue of the identified bone is supplied in Appendix 2, but a summary of what bones were found in which layer or context is given here.

4.10 The skull bones identified in the ploughsoil included parts of the mandible (lower jaw), occipital (base of the skull), and cranial vault fragments. Skull fragments among the museum bone included parts of the temporal bone (which supports the ear), frontal bone (area above the right orbit), part of a root from a lower molar, and vault fragments. In the upper layer of the urn, skull fragments included parts of the mandible, maxilla (upper jaw), several tooth roots and fragments of crown, zygomatic bone (cheekbone), frontal bone (area above the right orbit), left and right temporal bones, occipital bone, and vault fragments. The middle spit included parts of the mandible, zygoma, temporal, sphenoid bone (part of the base of the cranium), fragments of tooth root and fragments of cranial vault. The lower layer included a tooth (probably a premolar) and four fragments of cranial vault.

4.11 The axial bones identified in the ploughsoil included part of a vertebral body, probably from the thoracic or lumbar spine, and one rib shaft fragment was found with the museum bone. The upper layer of the urn included part of a cervical (neck) vertebra, several fragments of thoracic vertebra (which bear the ribs), and a couple of fragments of lumbar vertebra (lower back). Axial bones recovered from the middle layer included several rib fragments, parts of the atlas (uppermost neck vertebra) and axis (second neck vertebra), several fragments of cervical vertebrae, as well as

thoracic and lumbar vertebra fragments. The lower layer included fragments of cervical, thoracic and lumbar vertebrae, as well as a couple of rib shaft fragments.

4.12 The upper limb bones found in the ploughsoil included parts of the scapula (shoulder blade), clavicle (collarbone), and a hand phalanx (finger bone). A potential fragment of radius (forearm bone) was found with the museum bone. The upper layer of the urn included part of the scapula, humerus (upper arm bone), ulna (forearm bone), metacarpal (bone from the palm of the hand), and hand phalanges (fingers). Upper limb bones from the middle layer included parts of the clavicle, humerus, ulna, radius, and a hand phalanx. The lower layer included part of the humerus, radius, and a distal hand phalanx (bone from the tip of a finger).

4.13 The lower limb bones found in the ploughsoil and museum bone were restricted to parts of the femur (thigh bone). The upper layer of the urn included parts of the os coxa (pelvis), femur, tibia (shin bone), and a metatarsal (foot bone). The middle layer included parts of the os coxa, femur, patella (kneecap), tibia, fibula (bone from the lower leg), and metatarsals. Lower limb bones in the lower layer included parts of the femur, tibia, and a metatarsal.

Animal bone

4.14 Three fragments of potential animal bone, all probably from the same bone, were recovered from the middle layer of the urn, which weighed 0.5g. They were examined by a faunal specialist but could not be identified further than mammal.

Grave goods

4.15 A near-complete large copper alloy knife was deposited in the urn roughly at the junction of the upper and middle layers (Gwilt & Mumford 2016). There was evidence for damage to the hilt, either during use or caused prior to deposition (ibid.). The knife had apparently been deposited as a grave good, rather than being burnt on the pyre as a pyre good. A bronze pin was recovered from the middle layer, but it was thought likely that it had been placed in the urn at the same time as the knife (R. Hankinson pers. comm.). Tiny fragments of green-stained material were present in the upper layer within the urn and among the bone recovered from the ploughsoil. One or two of these small fragments may have been bone stained green from contact with copper alloy, but many of the other fragments appeared likely to be small fragments of metal.

Minimum number of individuals

4.16 None of the bone elements identified in any layer or context from Scethrog were duplicated, and no marked age-related variation in bone size or development was observed. This indicated the minimum number of individuals represented by all the material was one.

Assessment of age-at-death

4.17 Age estimation relies on examining particular areas of the skeleton for developmental and degenerative changes (Cox 2000). Even in relatively complete inhumation burials, where several indicators of age can be examined, it can be

difficult to place an individual into a particular age category. The issue is further complicated by the fact that no methods have been specifically developed for application to cremated remains, and none of those developed for inhumation burials have been tested on cremated bone (Mayne Correia 1997). Thus any age estimates derived must be regarded with caution.

4.18 The remains from Scethrog were from an adult individual, as various parts of the skeleton had completed development. These included tooth roots where the apices were fully closed, complete fusion of the tip of the axis dens, fusion of the proximal and distal ulna, fusion of the proximal end of a distal hand phalanx, and fusion of the vertebral annular rings. Small parts of the auricular surface of the pelvis had survived, but unfortunately not enough to evaluate the age of the individual more precisely. However, enough survived to indicate the individual was likely to have been older than ~25 years of age.

Sex estimation

4.19 Estimation of sex for adult individuals requires certain parts of the pelvis and/ or skull to be present (Mays and Cox 2000). Since bone shape can be affected by warping as a result of the burning process, this could make the sex estimation of cremated remains less reliable (Mayne Correia 1997). However, McKinley (2000b) has recorded a high degree of accuracy when estimating the sex of modern cremated remains (where the results could be checked with the known sex of the individual).

4.20 Unfortunately, few of the areas of the skeleton required for estimating sex were present among the Scethrog remains. The supramastoid crests (ridges of bone extending above the ears) were reasonably pronounced, and the gonial angle of the mandible appeared flared. Both are male traits, suggesting this individual may have been more likely to be male. However, the features of the cranium are generally less reliable than those of the pelvis in determining sex, and determining sex based on just two features is dubious, so the sex estimation is tentative.

Non-metric traits

4.21 Non-metric traits are minor variations that occur between individuals. Two non-metric traits were observed, including an accessory supraorbital foramen above the right orbit and mandibular tori on the right body of the mandible. The former is a small additional hole above the orbit, and the latter are nodules of bone along the inner margins of the tooth sockets.

Pathological conditions and dental health

4.22 Many of the fragments of joint surface had osteophytes (outgrowths of bone) at the margins, which can be associated with degeneration of the joints, and these do tend to become more frequent with age. Osteophytes were observed around the margin of the glenoid surface of the left scapula (shoulder joint), the trochlea of the right humerus (part of the elbow joint with the ulna), proximal right ulna (elbow), acetabulum (hip joint), and occipital condyle (joint between the base of the cranium and the uppermost cervical vertebra). Osteophytes were also observed around the margins of the apophyseal facets of cervical, thoracic and lumbar vertebrae (these are the joints between vertebrae at the posterior side of the spine), around the bodies of

a lumbar vertebra, and the bodies of two unidentified vertebrae. Two cervical vertebrae had osteophytes around the margins of the bodies, coupled with porosity of the body surfaces, indicative of degeneration of the vertebral discs (Rogers 2000; Roberts and Manchester 2005, 139-140).

4.23 Both fragments of patella that were present had 'patellar whiskers', or ossification of the tendon of the large quadriceps femoris muscle on the front of the thigh that encompasses the patella on its way to insert on the tibia just below the knee. Ossification of soft tissues is again something that can occur with age, although some individuals are more inclined to form bone in this way than others (Roberts & Manchester 2005, 146-147).

4.24 The posterior surface of the proximal shaft of the right tibia was present in the middle layer. This had a large outgrowth of bone along the soleal line, which is the attachment site for the soleus muscle (Figure 1). It is likely that this indicates an injury to the muscle (myositis ossificans; Roberts & Manchester 2005, 85). Soleus is a powerful plantarflexor of the foot, which means it acts to push the foot downwards and lift the heel. It is important in maintaining a standing position, as well as in locomotion (walking, running, jumping).

4.25 One fragment of right maxilla from the upper layer of the urn had a hollow area in the region where a tooth socket should be, the walls and floor of which were covered with porosity and small spicules of bone. This could potentially indicate the presence of a dental abscess, or a cyst (Hillson 1996, 285-287). A dental abscess develops following the accumulation of pus at the apex of a tooth root, often as a consequence of dental caries, although they can occur following heavy tooth wear or trauma to the tooth. Unfortunately, it was not possible to determine which tooth socket was affected, but it was probably one of the molars.

Discussion

4.26 The second millennium BC saw an increase in the practice of cremation of the dead combined with the burial of the cremated remains (Ray 1999, 29). Burial mounds and barrows were often placed in a prominent position, and the ritual of cremation would have offered the opportunity for an elaborate display (ibid.). Primary barrow burials often acted as a focus for the addition of later cremation burials (ibid., 30).

4.27 The amount of bone resulting from the cremation of modern adults was found to range from 1001.5g to 2452.5g, with a mean weight of 1625.9g (McKinley 1993). However, archaeological cremation burials frequently contain less cremated bone than this, and it is evident that usually not all the cremated remains were collected for burial (McKinley 1997; 2000a; 2006). Primary cremation burials from Bronze Age barrows frequently contain large quantities of cremated bone: between 902.3g and 2747.0g, with an average of 1525.7g (McKinley 1997, 142). While burials from Bronze Age cremation cemeteries tend to contain less bone per burial (average weights 327-466g), occasional burials weighing over 1000g are present (ibid). The weight of bone recovered from Scethrog (1555.6g), even following truncation and the presumed loss of an unknown quantity of bone, was certainly comparable with that produced during modern cremations and the amount found in primary barrow burial, and potentially consistent with a larger cremation burial from within a Bronze Age cemetery. Geophysical analysis of the site did not find evidence for the presence of a

barrow, but it was noted that soil conditions may not have been favourable for the detection of such features (R. Hankinson pers. comm.). It is possible that there are more cremation burials in the vicinity, either as secondary burials focussed around a barrow, or as part of a cremation cemetery.

4.28 McKinley (1997, 142; 2000a; 2006, 85) has suggested that the time invested in collecting bone from the pyre may be related to the status of the individual, although 'status' could be defined in different ways. The reasons suggested for the amount of time invested in bone-collection included: the wealth and/or authority of the individual; the notoriety (and potentially fear of) the individual; the personal feelings of respect for and attachment to the deceased (with a well-liked individual receiving more care and time expended on collecting bone fragments); and whether or not the deceased individual had living relatives.

4.29 Urned burials tend to contain a greater weight of bone than do unurned burials (McKinley 1997), and the quantity of bone recovered from the Scethrog burial is consistent with this. Many different factors affect the amount of fragmentation experienced by cremated bone, and these have been outlined by McKinley (1994). Some fragmentation occurs during the process of cremation itself, through dehydration, movement of the body and bones by those tending the pyre, pyre collapse, and the way in which bone is collected for deposition (ibid.). Cremated bone can also fragment following deposition (particularly if it is disturbed by later activity), and as a result of excavation and post-excavation processing (McKinley 2000b). Bone recovered from containers tends to be less fragmented, particularly if the container remains intact (McKinley 1994). The fact that most of the urn from Scethrog was intact will have helped to protect the bone inside and reduced fragmentation, and this was evident in the fact that bone fragments from the upper and middle layers tended to be larger. The most fragmented bone was present in the ploughsoil, and it is likely that the ploughing will have acted to break up the bone fragments. It is considered likely that the bone found within the ploughsoil did derive from the cremation burial, since a couple of fragments joined to bone from the burial deposited in the museum and potentially to bone from the upper layer within the burial. The bone was also similar in character and colour, and was consistent with the rest of the bone present within the urn.

4.30 The colour of the cremated bone indicates the degree of oxidation achieved during burning, and this in turn is related to the pyre temperature, the duration of the cremation, and the amount of oxygen available (McKinley 2000b, 404-406). The buff-white colour of almost all the bone recovered from the burial at Scethrog indicated that full oxidation had been achieved, with bone exposed to temperatures over ~600^{o}C in an oxygenated environment (McKinley 2000a). This indicates that enough fuel was collected to enable the pyre to burn at high temperatures for a sufficient length of time for full oxidation of the bone to occur (McKinley 2000a). It also indicates favourable weather conditions, since rain and high winds can hamper successful cremation (McKinley 2006, 81-82).

4.31 The amount of identifiable bone present comprised around a third of the overall weight of bone, with larger proportions of bone identified in the layers/ contexts with larger fragments. That skull fragments comprised a relatively large proportion of the identified bone is probably due to the fact that parts of the cranial vault remain identifiable even when they are broken into small pieces (McKinley 2000b; 2004b). In

contrast, small fragments of long bone are harder to identify to a specific bone, and bones of the axial skeleton are more fragile and so more likely to be destroyed (McKinley 2004b, 300). Tooth roots and small hand and foot bones were present, but not in large numbers. These parts of the skeleton are usually frequently identified among cremated remains (Mayne Correia 1997). It is possible that the way in which bone was collected from the pyre favoured the recovery of larger bones, for example collection by hand, although the fact that some of these smaller bones were recovered could indicate some material was scooped up (McKinley 2004b). Hand-collection of fragments may also be supported by the general lack of charcoal within the burial, and this lack of charcoal is fairly typical for Bronze Age urned cremation burials (McKinley 1997, 143). It did appear that the bones of the limbs and torso may have been placed into the urn first, filling most of the lower and middle layers, and that most of the bone from the skull had been placed into the upper layer along with more fragments of upper and lower limbs. Fragments of skull were also relatively common among the bone from the ploughsoil and deposited with Brecon Museum, which will have derived from the upper layer of the burial. The knife was found roughly at the junction of the upper and middle layers, along with a bronze pin, so it is possible these were placed into the urn before most of the skull bones were added. Typically, during the Bronze Age, pyre goods (burnt on the pyre with the body) were more common than grave goods (placed in the grave at the time of burial but not burnt on the pyre; McKinley 1997, 130; 2006, 86).

4.32 A few small fragments of animal bone were recovered from the middle layer. It is possible that this was either deposited at the same time as the knife and pin, or that it had been cremated on the pyre with the individual. Animal bone occurs in small quantities in around 16% of Bronze Age cremation burials on average, and the most common species identified are immature pig or sheep, and birds (McKinley 2006, 84; 1997, 132). Most animal bone probably derived from food offerings (ibid.), but animals may also have been pets or working animals. When only one or two fragments of animal bone are present (as at Scethrog) their inclusion may have been either deliberate (token inclusions of part of the animal) or accidental (possible misidentification of animal bone as human; ibid.).

4.33 A minimum of one individual was present in the urn. This individual was tentatively identified as a potential male aged over ~25 years. He had suffered from joint disease in the vertebrae in his neck, and various other spinal and extra-spinal joints had osteophyte formation that could be associated with degeneration of the joints. He had also injured a muscle in his lower right leg, and probably suffered from a dental abscess.

Conclusion

4.34 The cremated remains from Scethrog provide an opportunity to examine burial practices in the Bronze Age in Wales. A single urned cremation burial was identified, but the upper part of the urn had been truncated by ploughing and some bone fragments were recovered from the surrounding ploughsoil. There was evidence to support the suggestion that these fragments derived from the burial. The remains were tentatively identified as those of an adult potential male, who had suffered joint disease, soft tissue trauma, and a dental abscess during life.

4.35 The bone from all contexts and layers was predominantly buff/ white, suggesting it was burnt at sufficiently high temperatures and with enough available oxygen for long enough to ensure oxidation of most of the bone. This suggests the community had access to adequate supplies of suitable fuel, as well as the necessary skills and knowledge to construct and tend a pyre successfully.

4.36 Following cremation, it seems likely that a large proportion of the bone had been collected from the pyre and placed into the urn. It appeared there was some order to the deposition of the bone, with fragments from the limbs and torso preferentially placed into the bottom two-thirds of the urn. A copper alloy knife and pin, were then placed into the urn, before the urn was filled with more bone. This upper layer of bone contained a large proportion of skull fragments (although fragments of the limbs and torso were also present). Three small fragments of animal bone were recovered from the middle layer, and may have either been deposited deliberately with the metal items or have been an accidental inclusion. The urn had acted to protect the bone inside, which reduced the amount of fragmentation present and facilitated the identification of bone fragments. The identified bone fragments included various parts of the skull, spine, ribs, shoulders, arms, hands, pelvis, legs and feet, so all parts of the body were represented. While some small fragments including tooth roots and hand phalanges were present, which could suggest material was scooped up, these were not present in large numbers which could indicate much of the material was collected by hand. This is further supported by the lack of charcoal among the burial.

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Appendix 1: Data from palaeoenvironmental assessment

Context		**1**	**6**	**6**	**6**
Feature		**Plough-soil**	**Cremation**		
Spit			**Upper**	**Middle**	**Lower**
Spit depth			**0-5cm**	**5-10cm**	**10-15cm**
Material available for radiocarbon dating		✓	✓	✓	✓
Volume processed (l)		0.4	2.5	2.5	1.6
Volume of flot (ml)		4	20	20	10
Residue contents					
Bone (calcined)	indet. frags	+++	++++	++++	++++
Pot (number of fragments)		5	23	10	1
Flot matrix					
Charcoal		-	(+)	(+)	(+)
Coal		(+)	(+)	-	+
Copper alloy	small flakes	(+)	(+)	-	-
Quartz fragment (small)		-	1	-	-
Roots (modern)		+	+	+	+
Straw / chaff (modern)		(+)	(+)	-	-
Uncharred seeds		(+)	+	+	(+)
Charred remains (total count)					
(c) *Hordeum* sp (Barley species)	grain	-	-	-	2
Identified charcoal (✓presence)					
Acer campestre (Field Maple)		-	-	✓	-
Diffuse porous cf. Salicaceae (cf. Willow family)		-	-	-	✓
Quercus sp (Oaks)		-	✓	-	-

[c-cultivated. (+): trace; +: rare; ++: occasional; +++: common; ++++: abundant]

Appendix 2: Catalogue of identified bone fragments

PLOUGHSOIL

SKULL				
Bone	**Side**	**Detail**	**Frags**	**Other**
Mandible	-	Part body	1	-
Mandible	-	Part of left ramus – anterior margin and lingual	1	-
Occipital	-	Posterior half left occipital condyle	1	Osteophytes around margin of condyle
Cranial vault	-	Fragments	4	-
Cranium	-	Fragment	1	-

AXIAL				
Bone	**Side**	**Detail**	**Frags**	**Other**
Vertebra	-	Body fragment, probably lumbar/ thoracic	1	Osteophytes around margin of body

UPPER LIMB				
Bone	**Side**	**Detail**	**Frags**	**Other**
Scapula	L?	Lateral border of spine	1	-
Clavicle	R	Anterior part of distal third of shaft	1	-
Proximal/ intermediate hand phalanx	-	Distal half	1	-

LOWER LIMB				
Bone	**Side**	**Detail**	**Frags**	**Other**
Femur	-	Shaft fragment with linea aspera	1	-
Femur	-	Shaft fragment with linea aspera	1	-
Femur	-	Shaft fragment with linea aspera	1	Joins with fragment from museum bone
?Femur	-	Shaft fragment	1	Possibly joins with fragment from upper layer

MUSEUM BONE

SKULL				
Bone	**Side**	**Detail**	**Frags**	**Other**
Temporal	R?	Part of tympanic plate & inferior margin of external auditory meatus	1	-
Frontal	-	Right zygomatic process	1	Joins with fragment from upper layer
Tooth root	-	Part of lower molar root	1	Apex complete
Cranial vault	-	Fragments	14	-

AXIAL				
Bone	**Side**	**Detail**	**Frags**	**Other**
Rib	-	Shaft fragment	1	-

UPPER LIMB				
Bone	**Side**	**Detail**	**Frags**	**Other**
?Radius	-	Part of proximal shaft	1	-

LOWER LIMB				
Bone	**Side**	**Detail**	**Frags**	**Other**
Femur	-	Shaft fragment with linea aspera	1	-
?Femur	L?	Shaft, at distal end of linea aspera/ division into supracondylar lines	2	Two joining fragments
Femur	-	Shaft fragment	1	Joins with fragment from upper layer
Femur	-	Shaft fragment with linea aspera	1	Joins with fragment from ploughsoil

N.B. One unidentified long bone shaft fragment joins with an unidentified shaft fragment from the upper layer

UPPER SPIT

SKULL				
Bone	**Side**	**Detail**	**Frags**	**Other**
Mandible	-	Right ramus (central part with lingula) & coronoid process	3	3 joining fragments; also joins to fragment from middle layer
Mandible	-	Part of ?right gonial angle	1	Gonial angle possibly flared
Mandible	-	Part of external left body around mental foramen	1	-
Mandible	-	Fragment of body	1	-
Frontal	-	Central part of right orbit rim	1	Joins with fragment from museum bone; accessory supraorbital foramen present
Temporal	L	Petrous part with internal auditory meatus & part of carotid canal	1	-
Temporal	L	Tympanic plate, base of styloid process & inferior margin of external auditory meatus	1	-
Temporal	R	Supramastoid area, part of superior margin of external auditory meatus	2	2 joining fragments; supramastoid crest fairly pronounced
Temporal	R	Temporomandibular joint & root of zygomatic arch	1	-
Temporal	-	8 fragments of mastoid process	8	-
Tooth crown	-	Fragments	3	-
Tooth root	-	?Lower incisor	1	Apex complete
Tooth root	-	?Part of upper molar	2	2 joining fragments; Apex complete
Tooth root	-	Fragments	2	-
Maxilla	R	Posterior part of palate & alveolar bone	1	Potential dental abscess
Maxilla	R?	Internal part of alveolar bone from lingual surface	1	-
Maxilla	L	Part of nasal aperture & base of frontal process	1	-
Maxilla	L	External surface of posterior alveolar bone	2	2 joining fragments
Maxilla	L?	Part of infraorbital foramen and surrounding bone	1	-

Maxilla	-	Fragment	1	-
Zygoma	L	Maxillary process	1	-
Zygoma	L	Frontal process	2	2 joining fragments
Zygoma	-	Inferior margin	1	-
Occipital	-	Part of left squama, occipitomastoid suture	1	-
Occipital?	-	Part of foramen magnum?	1	-
Cranial vault	-	Fragments	2	2 joining fragments
Cranial vault	-	Fragments	2	2 joining fragments
Cranial vault	-	Fragments	2	2 joining fragments
Cranial vault	-	Fragments	42	-
Cranium	-	Fragment	1	-

AXIAL				
Bone	**Side**	**Detail**	**Frags**	**Other**
Cervical vertebra	-	Left half of body, pedicle, superior & inferior apophyseal facets	2	2 joining fragments; Superior left apophyseal facet has marginal osteophytes
Thoracic vertebra	-	Inferior left facet	1	-
Thoracic vertebra	-	Spinous process, probably T1 or upper thoracic	1	-
Thoracic vertebra	-	Left lamina	1	-
Thoracic vertebra	-	Superior apophyseal facet, probably lateral half of right facet	1	Marginal osteophytes; possibly joins to fragment of thoracic vertebra below
Thoracic vertebra	-	Superior right apophyseal facet, medial half	1	Marginal osteophytes; possibly joins to fragment of thoracic vertebra above
Thoracic vertebra	-	Inferior right apophyseal facet & part of anterior right lamina	1	-
Lumbar vertebra	-	Superior apophyseal facet, probably left	1	-
Lumbar vertebra/ T12	-	Inferior left apophyseal facet	1	-

UPPER LIMB				
Bone	**Side**	**Detail**	**Frags**	**Other**
Scapula	L	Glenoid fossa	1	Marginal osteophytes
Humerus	R	Small part of distal joint, medial margin of trochlea	1	Marginal osteophytes
Ulna	R	Olecranon process, proximal half of joint	1	Marginal osteophytes
Metacarpal	-	Shaft fragment	1	-
Proximal/ intermediate hand phalanx	-	Shaft	1	-
Proximal hand phalanx, possibly 5th	-	Distal three-quarters	1	-
Proximal/ intermediate hand phalanx	-	Shaft	1	-

LOWER LIMB				
Bone	**Side**	**Detail**	**Frags**	**Other**
Os coxa	-	Part of margin of auricular surface	1	Marginal osteophytes
Femur	-	Shaft	2	2 joining fragments; also joins with fragment of museum bone
?Femur	-	Shaft near proximal end?	3	3 joining fragments; possibly joins with fragment from ploughsoil
Tibia	-	Part of anterior crest	1	Joins with fragment from middle layer
?Tibia	-	Fragment of distal end with part of joint surface?	1	-
Tibia	-	Lateral surface of midshaft with interosseous crest	4	4 joining fragments
Tibia	L?	Midshaft, anterior crest	3	3 joining fragments; also possibly joins with fragment from middle layer
Metatarsal 2?	L	Proximal end of dorsal surface	1	-

N.B. One distal end of a hand/foot proximal phalanx and one fragment of metacarpal/ metatarsal shaft present.
One unidentified long bone shaft fragment joins with fragments from the middle layer; one unidentified long bone shaft fragment joins with a fragment from the museum bone

MIDDLE SPIT

SKULL				
Bone	**Side**	**Detail**	**Frags**	**Other**
Mandible	-	Right condyle and neck	1	Joins with fragments from upper layer
Mandible	-	Right body internal surface	1	Mandibular tori present
Zygoma	R	Posterior margin and central area	1	-
Temporal	L?	Small part of superior margin of external auditory meatus	1	-
Temporal	L?	Small part of supramastoid area	1	Supramastoid crest fairly pronounced
Temporal	L	Temporomandibular joint & root of zygomatic process	0.5	Fused to sphenoid below
Sphenoid	-	Part of left greater wing with foramen rotundum and part of foramen ovale	0.5	Fused to temporal bone above
Tooth roots	-	Fragments	2	-
Cranial vault	-	Fragments	12	-
Cranium	-	Fragments	2	-

AXIAL				
Bone	**Side**	**Detail**	**Frags**	**Other**
Rib	R?	Shaft fragment near angle	1	-
Rib	-	Shaft fragment	2	2 joining fragments
Rib	-	Shaft fragment	1	-
Rib	-	Shaft fragment	1	-
Atlas	-	Left half of posterior arch	1	-
Axis	-	Dens, right half of body, superior right apophyseal facet	2	2 joining fragments
Axis	-	Left lamina & part spinous process, part inferior left apophyseal facet	1	-

Cervical vertebra	-	Body & right pedicle, superior right apophyseal facet, part inferior right apophyseal facet	2	2 joining fragments; Both body surfaces have marginal osteophytes, slight osteophytes on the surfaces, and porosity
Cervical vertebra	-	Body & right pedicle, part superior right apophyseal facet	1	Superior body surface has marginal osteophytes, slight osteophytes on the surface, and porosity; possibly joins to body fragment from lower layer
Cervical vertebra	-	Left pedicle, superior left apophyseal facet & part inferior left apophyseal facet	1	Marginal osteophytes around both apophyseal facets
Cervical vertebra	-	Left pedicle, superior left apophyseal facet & part inferior left apophyseal facet	1	Marginal osteophytes around both apophyseal facets
Thoracic vertebra	-	Superior apophyseal facet, probably left	1	-
Thoracic vertebra	-	Part inferior left apophyseal facet & anterior surface of left lamina	1	-
Lumbar vertebra	-	Left third of body & left pedicle	-	Slight marginal osteophytes around inferior body margin
Lumbar vertebra	-	Inferior left lamina & part inferior left apophyseal facet	-	Marginal osteophytes
Vertebra	-	Body fragment, probably lumbar or thoracic	-	Osteophytes around body margin

UPPER LIMB				
Bone	**Side**	**Detail**	**Frags**	**Other**
Clavicle	L	Mid and distal shaft	2	2 joining fragments
?Clavicle	-	Part sternal-mid shaft?	1	-
Humerus	L?	Medial side of distal third of shaft	3	3 joining fragments
Humerus?	-	Shaft fragments	2	-
Ulna	-	Part of proximal joint	1	-
Ulna	-	Part of distal end	1	Distal epiphysis fused
Radius	-	Midshaft with pronator teres attachment	1	Joins to fragments from lower layer
Proximal/ intermediate hand phalanx	-	Distal half	1	-

LOWER LIMB				
Bone	**Side**	**Detail**	**Frags**	**Other**
Os coxa	L?	Fragment of anterior superior iliac spine (ASIS)?	1	-
Os coxa	-	Fragment of iliac crest	1	-
Os coxa	-	Fragment of ilium	1	-
Os coxa	-	Fragment of acetabulum	1	Marginal osteophytes
Os coxa	-	Fragment of auricular surface	1	Surface probably over stage 2 (25+ years)
Femur	-	Part of proximal shaft/neck	1	-
Patella	L?	Lateral half?	1	Patellar whiskers
Patella	-	Part anterior surface	1	Patellar whiskers
Tibia	R	Posterior surface of proximal third shaft	3	Thick prolific outgrowth of bone along soleal line, smooth on lateral side, rougher and more irregular on medial side, crest of ridge damaged; 31.5mm long, 9.2mm

				wide, projecting 8.5mm. Soft tissue trauma
Tibia	-	Shaft, probably posterior and part of interosseous crest	5	5 joining fragments
Tibia	L?	Anterior part proximal shaft approaching tibial tuberosity	1	Joins with fragments from upper layer
Tibia?	-	Part of anterior crest	1	Joins with fragment from upper layer
Fibula	-	Shaft	2	2 joining fragments
Fibula	-	Shaft fragment	1	-
Metatarsal	-	Head	1	-
Metatarsal	-	Shaft	1	-

ANIMAL BONE				
Bone	**Side**	**Detail**	**Frags**	**Other**
Long bone	-	Shaft fragment	3	3 small fragments of animal bone, 2 fragments possibly join

N.B. Two unidentified long bone shaft fragments join with a fragment from the lower layer; 2 fragments of unidentified long bone join with fragments of bone from the upper layer

LOWER SPIT

SKULL				
Bone	**Side**	**Detail**	**Frags**	**Other**
Tooth	-	Probably premolar, root and internal part of crown	1	Apex complete
Cranial vault	-	Fragments	4	-

AXIAL				
Bone	**Side**	**Detail**	**Frags**	**Other**
Rib	-	Shaft fragment	1	-
Rib	-	Shaft fragment	1	-
Cervical vertebra	-	Left side of body	1	Possibly joins with fragment from middle layer
Thoracic vertebra	-	Superior left apophyseal facet, left pedicle & left postero-superior body	1	-
Thoracic vertebra	-	Medial part of both laminae	1	-
Thoracic vertebra	-	Anterior right lamina & medial half inferior right apophyseal facet	1	-
Thoracic vertebra	-	Inferior left apophyseal facet	1	-
Thoracic vertebra	-	Inferior left apophyseal facet, part lamina & pedicle	1	-
Lumbar vertebra	-	Superior left apophyseal facet	1	Marginal osteophytes

UPPER LIMB				
Bone	**Side**	**Detail**	**Frags**	**Other**
Humerus?	-	Part of distal joint?	2	2 joining fragments
Radius	-	Shaft	4	4 joining fragments; also joins with fragment from middle layer
Distal hand phalanx	-	Proximal three-quarters	1	Proximal end fused

LOWER LIMB				
Bone	**Side**	**Detail**	**Frags**	**Other**
Os coxa	-	Small part iliac fossa & part of margin of auricular surface	1	-
Femur	-	Shaft fragment with linea aspera	1	-
Tibia	L?	Tibial tuberosity?	1	-
Tibia	-	Anterior crest	2	2 joining fragments; also joins to fragments from middle layer
Metatarsal	-	Head	1	-

N.B. One unidentified long bone shaft fragment joins with a fragment from the middle layer; One fragment of metacarpal/ metatarsal shaft present

Appendix 3: Summary of the data on the cremated remains

Table 1 Cremated remains: summary

Colour	Total Weight (g)	Weight as % of modern*	Max Frag. Size (mm)	ID	Age	Sex
White/ buff, very occasional pale grey or mid/dark grey	1555.6	95.7	73.9	Human & Animal?	25+	M??

* Total weight of cremated bone expressed as a percentage of the average weight of bone recovered from a modern cremation (1625.9g, McKinley 1993)

Table 2 Cremated bone: fraction weights

Spit	10mm		5mm		2mm		Total		Max Frag.
	g	%	g	%	g	%	g	%	mm
Ploughsoil	37.4	30.2	67.3	54.3	19.2	15.5	123.9	8.0	36.5
Museum*	41.3	58.6	27.6	39.1	1.6	2.3	70.5	4.5	49.9
Upper	274.5	45.7	200.6	33.4	125.9	20.9	601.0	38.6	61.6
Middle	282.6	51.9	175.1	32.1	87.0	16.0	544.7	35.0	73.9
Lower	78.1	36.2	82.9	38.5	54.5	25.3	215.5	13.9	48.7
Total	**713.9**	**45.9**	**553.5**	**35.6**	**288.2**	**18.5**	**1555.6**		

* Bone collected by the metal detectorist and delivered to Brecon Museum

Table 3 Identifiable bone: weight and percentage

Context	Skull		Axial		Upper Limb		Lower Limb		Total	
	g	%	g	%	g	%	g	%	g	%*
Ploughsoil	8.3	35.6	0.7	3.0	4.7	20.2	9.6	41.2	23.3	18.8
Museum	15.0	47.0	0.4	1.3	2.3	7.2	14.2	44.5	31.9	45.2
Upper	112.4	59.0	7.9	4.1	7.3	3.8	63.0	33.1	190.6	31.7
Middle	37.4	19.7	28.9	15.2	41.4	21.8	82.4	43.3	190.1	34.9
Lower	7.8	22.1	6.7	19.0	5.4	15.3	15.4	43.6	35.3	16.4
Total	**180.9**	**38.4**	**44.6**	**9.5**	**61.1**	**13.0**	**184.6**	**39.2**	**471.2**	**30.3**

* Total weight of identified bone expressed as a percentage of the total weight of bone per context

Figure 1: Soft tissue trauma to the soleal line (proximal right tibia, posterior surface)