ANTIQUITY
a review of world archaeology

CAMBRIDGE
UNIVERSITY PRESS

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Journal:	*Antiquity*
Manuscript ID	AQY-RE-19-197.R1
Manuscript Type:	Research
Date Submitted by the Author:	n/a
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Keywords:	Early Bronze Age, Isle of Man, bone artefacts, mortuary practices
Research Region:	Britain & Ireland

Thinking outside the cist: interpreting an unique artefact assemblage from an Early Bronze Age burial on the Isle of Man

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Abstract

Recent analysis of cremated human remains from an Early Bronze Age cist at Staarvey Farm, Isle of Man, discovered a rare bone knife pommel and 20 other bone objects. This assemblage gives us a glimpse of the importance of bone ornaments and artefact fittings in the Early Bronze Age. The article analyses the Staarvey burial and comparable assemblages, identifying the deployment of knife pommels in central Britain in ways which contrast with their use in southern England. It explores regional interaction in the Early Bronze Age of the British and Irish Isles through a multi-dimensional, relational typological approach to burial assemblages.

Introduction

In 1947 a short cist was discovered at Staarvey Farm on the Isle of Man. Two ceramic vessels were recovered during excavation, along with cremated human remains and a lithic assemblage. In 2016 an osteological examination of the cremated remains was conducted as part of the *Round Mounds of the Isle of Man* project. A rare bone knife pommel was found, along with 20 other previously unknown bone objects, including 14 bead fragments, a toggle, a bone point and four enigmatic worked bone artefacts (‘bone oblongs’). The pommel is the first to be identified from the Isle of Man, and the bone oblongs have no known comparators. These discoveries prompted a wider analysis of Early Bronze Age burials sharing

some of the traits of this burial deposit and a consideration of the importance of bone grave goods in the period.

This paper adopts a multi-dimensional, relational typological approach to burial assemblages (Fowler 2017). Traditional typological analyses assess the form of a single object in relation to others of the same type. By contrast, the approach employed here examines each mortuary assemblage as a combination of traits, comparing one mortuary deposit with others which share several such traits. By considering the type and location of the burial feature, the range of artefact types present, the form, material and decoration of such artefacts, and the treatment of human remains and artefacts, it is possible to identify similar burial assemblages and then consider the differences between them. Comparison operates at a large geographical scale in order to detect spheres of local and regional interaction. Working beyond a single artefact corpus highlights how similar-yet-different assemblages were brought together in burial contexts in creative, reflexive ways. As such, this approach moves beyond culture-historic models in which geographically-bounded communities repeatedly carry out traditional practices. This article employs this relational typological approach to identify overlapping spheres of funerary practice across central Britain, including the deployment of knife pommels in ways which contrast with southern England. It thereby contributes to discussions of methods for analysing burial assemblages and regionality in the prehistoric past.

The burial context

A short cist made from slate slabs at Staarvey Farm, German parish, was excavated by Basil Megaw in 1947 but remained unpublished until 1999 (Woodcock 1999) (Figure 1). Two inverted vessels were found in the cist: a Collared Urn (Figure 2; Longworth, 1984: 214, Fig 104d; Woodcock 1999: 93) and a vessel which had lost its rim and was broken into 22 sherds, including two with an incised lattice design and two with an applied cordon (Woodcock 1999: 93–5). The Collared Urn was surrounded by a ring of pebbles, all but one of which were quartz. A burnt plano-convex flint knife and a burnt flint end-scraper were also found, although their exact locations within the cist were not recorded. Cremated bones were found under both vessels, elsewhere in the cist, and spilled beyond the south end of the cist (perhaps when the capstone was displaced) (Woodcock 1999).

The human remains

The human remains from Staarvey Farm were examined at the Manx Museum in October 2016 employing standard methods of observation and analysis (Buikstra and Ubelaker, 1994; McKinley, 2004). The material was sieved with 2mm mesh (pre-sieved weight 4410.14g; sieved bone weight 3268.40g). Only a small amount of charcoal was present. All the skeletal material was calcined white, creamy-white or grey-white and showed significant warping, cracking, transverse checking and longitudinal fracturing. It was highly fragmented with relatively few large pieces. A minimum of four individuals was identified, based on fragments of the left petrous portion of the temporal bone (Figure 3). At least two adults are represented, with a supra-orbital rim fragment of the frontal bone and the robusticity of several cranial fragments indicating a likely male. There is one adolescent, aged 10–15 years-at-death based on unfused long bone epiphyses of a left proximal humerus and an unsided proximal radius. Minimal remains of an infant/child, aged between 1–3 years at death were also identified. Portions of all parts of the body were identified, including 35 hand phalanx fragments. The bone weight of 3268.4g for four individuals, one of which is adolescent and one of which is an infant, suggests that most, but not all, of the cremated bone from the older individuals was buried.

These observations suggest that complete, fleshed bodies were burned and carefully collected from the pyre site, with the high level of fragmentation suggesting the bones may have been manipulated while still hot (Thompson *et al*. 2017: 320–22). It is not possible to know whether the individuals were cremated together or separately, but the cremation process appears consistent across all the remains. It is not possible to reconstruct which bones came from which locations within the cist or to tell whether bones were deposited in one event or several. Three human bone fragments may have been worked.

Bone artefacts found within the cremated human remains

The pommel

The bone pommel is elliptical in plan with an elongated lipped socket (Figure 4). It is a cream colour with smooth surfaces and some evidence of cracking but no warping, suggesting it was directly exposed to heat. The bone derives from a ‘weight-bearing

compact bone of a large terrestrial mammal, such as cattle or horse' (Sonia O'Connor, pers. comm.). While the top of the pommel is complete the wall of the socket is broken in half lengthways with one side missing, likely due to exposure to high temperature. The surviving side exhibits two tiny perforations which are presumably holes for pegs that attached the pommel to a knife handle. The top of the pommel is slightly dished.

The elliptical socket and strongly expanded profile are characteristic of a Class 3 pommel within Needham's recently revised typology (Woodward *et al*. 2015: 45–6). At a maximum width of 2.62cm and breadth of 0.79cm the pommel is very small, and the socket would not accommodate the butt of a handle wider than 1.5cm or thicker than 0.45cm: this suggests a thin knife handle about the size of a modern table knife. Hardaker (1974: 49) and Needham (2011: 388; cf. Woodward *et al*. 2015: 53) suggested that pommels of this type under 3.5cm wide were from 'knife-daggers', which have been found with burials of women, men and juveniles (Woodward et al. 2015: 518–9). We simply refer to it as a knife pommel.

Bone beads and possible toggle

Fourteen fragments of bone beads, including one from a possible toggle, were identified (Figure 5). These are likely to be cut from bird bones, have smoothed surfaces, and slightly polished exterior surfaces. All appear to have been fractured by burning and are white, with some showing black marks. Two ridged and grooved terminal fragments are made of thin bone which was smoothed hollow on the inside and polished on the outside (Figure 5). A third smoothed and polished bead is perforated with a 0.22cm diameter hole and is broken across this perforation. This could be a fragment of a toggle rather than a bead (Woodward and Hunter 2015a: 121–3) or even part of a bone whistle (ibid., 2015a: 117). The remaining fragments are from beads with a simpler form; none are complete, but all show working on at least one end.

Relatively little work has been done on bone beads compared to those in more exotic materials. There are four other cases where beads (of varying materials) have been found with bone pommels in burials: these are all Needham class 3 pommels, and all are associated with Collared Urns (Bedd Branwen burial H, Radwell barrow I, Manton barrow, and Winterbourne Stoke G66). Those from Bedd Branwen H and

Staarvey include bone beads, while a bone toggle was also found with a class 3 bone pommel at Beech Hill House (Stevenson et al. 1995). Beads occur along with pommels associated with both male and female remains.

Bone point

A perforated burnt bone point was found in three parts, with the tip missing (Figure 5). The perforation was drilled from both sides; the point has broken across this hole and again nearer to the tip. The point has curved sides giving a sub-oval cross-section, and is curved longitudinally — it is tan with some brown patches and a crack along one side, suggesting thermal application. The object has been ground and polished producing a smooth surface.

In Woodward and Hunter's (2015a: 97) typology this is a Class 4 bone point, distinguished by the worked and rounded end and the head perforation. About three quarters of the bone points examined by Woodward and Hunter (2015a: 97–109) showed little or no evidence of damage on the tip, as might be expected if the point was used as a tool. They describe some points as showing light wear around the perforation indicating that they were worn by cord or thread, and suggest they may have been stitched onto a garment or head-covering (Woodward and Hunter 2015a: 105). Bone points found within burials of unburned remains were positioned close to the head. They have been found in the graves of both men and women, and while the latter predominate this seems to vary regionally and/or chronologically (*ibid*.; Parker Pearson *et al*. 2019: 193).

Four worked bone oblongs

These are four, sub-rectangular, slightly curved bone objects, formed most likely of animal cortical bone (Figure 6). They are white with smooth polished surfaces and are uniform in size (between 28–30mm long, 8.5–8.9mm wide, and 3.0–3.6mm thick) and appearance. They are thickest in the middle and taper to relatively sharp edges at both ends; they have one flat face and one slightly concave face. The sides are slightly rounded with a convex shape. Each exhibits cracking and some mild transverse checking consistent with burning.

We know of no direct comparators for these objects. Woodward and Hunter (2015a: 118–20) identify several 'bone plates' made of animal bone, likely cow rib, from

barrow contexts in Wiltshire, suggesting these were components of body ornaments — but these are all at least twice the size and none have the dished surfaces of the Staarvey oblongs. The Staarvey oblongs remain enigmatic: they might have provided shape to a garment or headdress if sewn within it, they could have been used as tokens, or perhaps their chiselled ends were used to finish and decorate pots – such as the incised lines on the collar of the urn from Staarvey.

Further detail on the Staarvey Farm cist, artefacts and human remains, including accession codes, can be found in the online supplementary material.

Radiocarbon dating

A sample of the cremated bone has been dated to 3515+-45 BP (GrA-29940: 1956–1696 cal BC) (Woodcock 2008: 152). It is not possible to determine which individual this bone derives from. Two other radiocarbon dates from burials with class 3 pommels (Bedd Branwen H and Raunds 1) are also within the range *c.*1950 to 1700 BC, while Galley Low overlaps with this and Beech Hill House provides an earlier date (Table 1). While human bone absorbs some of the carbon signature of the fuel during cremation, pyres likely included young wood and the impact is expected to be minimal (Snoeck et al., 2014: 599).

Wider comparisons

A number of burials from Britain share similarities with key components of the Staarvey burial feature, depositional practice, or artefact assemblage (Table 1). One of the most similar burials is 1 km away at The Cronk, Upper Lherghydhoo, where a sandstone cist contained an inverted Food Vessel Urn and two bone bodkins, a bone point and two bone beads (Woodcock 1996: 232, 240–2) (Figure 7), and the cremated remains of two adults and one 2–4 year old (Gamble pers. comm.). The bone assemblage shows signs of burning. The cremated remains date to 3440 ±40 BP (GrA-29936: 1881–1658 cal BC) (Woodcock 2008: 153). While the number and type of vessels differ, the form of the cists and the mortuary assemblages are very similar and roughly contemporary. Both burials included a range of bone ornaments and the remains of multiple individuals.

The pattern of incised lines around the collar of the Staarvey Farm Collared Urn shares similarities with Collared Urns in Ireland, Wales, southern Scotland and

northern England which Longworth (1984) largely grouped together in the 'North West Style' of his 'secondary series'. Of the 10 Collared Urns and one Vase Urn/Food Vessel Urn found with class 3 pommels the vessels from Merddyn Gwyn and Bwlch y Rhiw are very similar to each other, as are the Staarvey and Bedd Branwen H vessels (Figure 8). The similarity in vessel form is strongest, but there are shared decorative elements in the latter case; shape and decoration may have been significant in conveying some aspect of the identity of the deceased or those making the vessels (e.g. kinship).

<Figure 8>

Nine burials of cremated remains associated with both Collared Urns and class 3 bone dagger pommels are known (Needham, 2015: 46). By contrast, only one of the 20 known pommels of classes 1, 2 or 4 was found with a Collared Urn (at Stanton Moor – Longworth 1984: 175). Some class 1 and 2 pommels and one class 4 pommel were found with knives accompanying burials with Beakers, and the remains associated with these pommels were not cremated. This likely indicates that class 3 pommels were later than those associated with Beakers, but also underlines the tight association between class 3 pommels and a specific mortuary practice in central Britain. The inhumation at Galley Low is a notable exception with an earlier date and an accompanying Food Vessel. Other burials with class 3 pommels from northern Wales, the Pennines, and the Isle of Man exhibit a narrow range of ways to treat cremated remains in Collared Urns with bone pommels: they were largely buried inverted either in cists or at the peripheries of cairns or barrows (Table 1). Short cists had been frequently used for burial in the mid and later third millennium, including on the Isle of Man where they contained either unburnt or cremated remains (Crellin, 2019; Crellin *et al*. forthcoming), but the practice of placing Collared Urns in cists seems to have been relatively rare given the popularity of both cists and Collared Urns in the late third and early second millennium: Longworth (1984) reported only 44 cases in his catalogue of over 2230 Collared Urns, and 22 of those were in Wales or western England.

Four burnt pommels from the Irish Sea region exhibit a lengthways break in the socket wall or the entire pommel. The closest of these to Staarvey Farm is Burial H at Bedd Branwen kerbed ring cairn, which consisted of a Collared Urn inverted in a

small cist containing cremated bone from at least two individuals, a burnt bone bead, and a bone class 3 pommel; several unburnt jet and amber beads were placed on top of the cremated bone in the vessel, ending up at the bottom of the deposit (Lynch 1971). As noted above, the urn decoration is very similar to that from Staarvey (Figure 8). The treatment of remains and artefacts is also similar – burning more than one body and a knife, collecting the burnt bone and the fragmented pommel, placing these in an urn, and placing that inverted in a cist. There were also subtle differences — such as the addition of unburnt jet and amber beads, potentially from different necklaces, at Bedd Branwen H — perhaps relating to differences in the identities of the deceased and/or mourners sharing similar mortuary practices.

Shifting to a larger scale, greater differences are evident (Figure 9). The 20 known Class 3 pommels all have similar form, but there are differences in size and material (Table 1). Two of the larger bone examples, Galley Low and Beech Hill House, are from burials with 'early' dates that diverge from the pattern we suggest for smaller pommels. Fourteen class 3 pommels were made in bone or antler: these are largely focused around the east of the Irish Sea, and most were found with cremated remains. Two were cetacean bone, both from southern England: Winterbourne Stoke G4 and G66 (Woodward *et al*. 2015: 47, 53). A wood or horn pommel was preserved in a wetland in Ireland; it is possible many more wooden examples existed. A pommel found in the River Thames was cast as part of a handle in bronze. Three class 3 pommels from Wessex were made from amber: one was found among a complex array of artefacts in bronze, clay, chalk, gold, amber and shale 'nine feet' from the crouched inhumation of a woman (sex identified using now-outdated methods) wrapped in cloth at Manton barrow (Cunnington 1907). The burial mode, type of site, and range of surviving objects and materials differs from the central British group to which we suggest Staarvey belongs.

There was some overlap in the hue of materials used across southern and northern class 3 pommels: nowhere were pommels made from dark materials such as shale or jet even though these were used for other personal ornaments in this period. But we suggest the southern class 3 pommels were a different category of thing to their northern counterparts. The pommels from the far south of England share the same form as bone pommels, but captured other properties in their substance: the golden translucence and scarcity of amber, with its origins in the east and the sea, from

where the sun rises, might have lent power to some southern knives; the bones of whales may have had similar marine associations. Class 3 pommels with post-1700 BC associations, such as Winterbourne Stoke G4, are from the south of England and it is possible the exotic examples here are later developments from the wider class or were curated: the overall pattern does not suggest northern communities copying elite objects in mundane materials, but rather some in the Wessex region creating new exotic versions of what might have been small and ordinary things in wider use further afield.

We therefore suggest that small knives with class 3 bone pommels were associated with Collared Urns as a recurring assemblage — a set of equipment that played specific roles in funerary rites involving cremation — from the Isle of Man across northern Wales and into the west Pennines, some time within 1950–1700 BC. It is unclear whether the pommels were present among cremated remains because they had been habitually worn by the deceased — or one of the deceased, given that several included remains from more than one person (or, indeed, included as something important to the relationship between the deceased) — or because they played some specific funerary role. However, it is important to set them in the context of a wider bone artefact assemblage focussed on bodily adornment. While a detailed, large-scale review of bone ornaments is arguably overdue, it is beyond the scope of this article: for now, we suggest that such objects were commonly worn or used in the period and that while they are likely to survive better than other organic materials they are also likely to have been overlooked in older excavations of cremated remains. Bone objects on Bronze Age funerary pyres warped, cracked and changed colour, and by the end of the cremation the remains of these artefacts blended in with human remains. For mourners, burnt bone objects might have become increasingly inalienable from the deceased by sharing the process of cremation, dissolving any distinction between bodies and associated objects. Perhaps bone was chosen for making personal accoutrements in central Britain partly with this transformation and merging of body and object in mind.

Overlapping spheres of interaction

At Staarvey Farm, people were making decisions in a similar way to some of those burying their dead on Anglesey, in North Wales, and western England during the

same period. While this is only one burial from the Isle of Man, and others had very different characteristics (Crellin *et al*. in prep.), it is worth considering the choice of grave goods at Staarvey Farm in a wider regional context.

The class 3 pommels from Wessex lie in an area with a concentration of contemporary daggers, as do those from Radwell and Raunds (Woodward and Hunter 2015b: 548), but those from Wales and northwest England lie in areas without daggers – indeed, these are regions with no history of dagger use from the Chalcolithic, and where burials with Beaker pottery had also been very rare. Axe-hammers are numerous early second millennium finds in Dumfries and Galloway and Lancashire (Roy 2019), but less common in the areas where class 3 pommels have been found — these two kinds of objects may have had different resonances. Battle-axes are rarer than axe-hammers but have been found in Dumfries and Galloway, and more battle-axes (7) than axe-hammers (1) are known from the Isle of Man (Crellin 2019: 28–9). Cordoned Urns (dating to c. 2000–1550 BC) are also found on the Isle of Man, the north and east of Ireland, Anglesey and southwest Scotland and eastern Scotland: areas where battle axes were present in relatively high numbers. We therefore suggest the Isle of Man was involved in at least two overlapping zones of interaction c. 2000–1700 BC, one of which extended from the island across western Wales and western England (and included the use of knives with bone pommels), and the other crossing the north of Ireland and southwest Scotland into eastern Scotland (associated with Cordoned Urns and battle-axes). These zones encompass regions with forms of material culture and mortuary practices that partly overlap with, yet are largely distinct from those of contemporary Wessex ('Wessex I'). Further analyses of the contexts in which such objects were deposited, and their distribution, may help understand the shifting lattices of interaction through which such objects developed in relation to one another.

Traditional typological approaches have often been used to support culture-historic interpretations of regional identities. A relational typological approach compares similar burials from, say, one region where a certain type of artefact is present and another region where it is not (e.g. burials with pommels and Collared Urns on the Isle of Man and Anglesey, where Cordoned Urns are present, and in the Pennines, where Cordoned Urns are absent). It highlights how what appears to be one type of artefact may have different significances, even *matter* differently, as it is deployed

alongside the other media present in one region but not another (e.g. bone pommels in regions of central Britain without a history of daggers, compared with pommels in exotic media in southern regions historically associated with daggers). Through this approach, distribution maps of one type of object (or burial or site type) and interpretations of culture-historical territories can be supplemented or replaced by overlapping distributions of traits partly shared by complex assemblages. In the case of the Early Bronze Age in at least Britain, such distributions of related traits tallies well with the stable isotope evidence for mobility across geological zones during life (Parker Pearson et al., 2019). Identity consists of many intersecting factors (e.g. age, gender, religion), and choices about artefact style may vary according to any of these — shifting by age cohort as much as ethnicity, for instance (e.g. Larick 1986). The relational typological approach deployed here therefore interprets the Staarvey burial as a result of meaningful funerary transformations and mortuary practices in which people well-connected with neighbouring islands drew from a broadly-shared pool of well-understood practices and media as they articulated relations with and between the dead.

Conclusion

The Staarvey assemblage gives us a glimpse of the importance of bone objects in the Early Bronze Age. Wider comparisons suggest this was part of a bone-working tradition that was strong in north Wales and the north of England as well as the Isle of Man. These are regions where ornaments or fittings in exotic materials, such as jet, were rarer than in the Wessex region, Yorkshire, or the west and east coasts of Scotland (Sheridan and Davies 2002). It seems likely that bone ornaments were widely used, and only in some areas were versions of bone objects made in other materials, sometimes late in the currency of such objects.

The analysis of the osteological material from Staarvey revealed a previously unknown assemblage of artefacts which has opened further discussion on Early Bronze Age personal ornaments and tools, and how the decisions made by those participating in the mortuary activities at this site related to practices in neighbouring regions. Attending not only to the form of an object, but also its size, material, treatment and deposition, in a multi-dimensional typological approach, allows us to refine and move beyond traditional typologies to trace not just types of things, but

types of practices. Communities on the Isle of Man shared some such practices with several neighbouring regions. Just as the Staarvey burial illustrates similarities with aspects of contemporary burials across western central Britain, it also helps in identifying disjunctures with other regions where similar types of artefacts were made in other materials and were deployed in different kinds of funerary practices.

Authorship statement

MG carried out the osteological analysis discovering the bone assemblage. All authors examined and recorded the bone artefacts. CF carried out the comparative analysis. All authors contributed to writing the final article.

Acknowledgements

Many thanks to Allison Fox for facilitating research at the Manx Museum, Stuart Needham for confirming typological identification, and Sonia O'Connor for visually assessing the bone material. Thanks to Jenny Woodcock, Manx National Heritage, Cambridge University Press and Bedfordshire Archaeology for image permissions. The osteological analyses were funded by Culture Vannin. *Rounds Mounds of the Isle of Man* has received financial support from Manx National Heritage, the Universities of Leicester and Newcastle, and the Isle of Man Steam Packet Company.

Table 1: Burials with Class 3 bone pommels. Sites from central Britain and the Isle of Man highlighted grey. All dates are calibrated to 95.4% probability using OxCal v3.4.2 with IntCal 13. A more detailed version of this table is provided in the supplementary material.

Site (Number on Fig 9)	Region	Material, condition	C14 dates	Feature/site	Vessels (inverted)	Other associated artefacts	MNI, age, sex, cremation/ inhumation
Balleymoney (2)	Antrim	Wood or horn?, intact	-	bog	-	-	-
Bedd Branwen (burial B) (4)	Anglesey	**Bone, burnt**	1742-1322 cal BC	Pit, edge of ring cairn	**CU**/EFVU **(i)**	Hone	1: adult male (osteoarthr), **C**
Bedd Branwen (burial H) (4)	Anglesey	**Bone, burnt, axial fracture**	1929-1753 cal BC	Cist	**CU (i)**	**Bone bead**, 6 amber beads, 4 jet beads	2: young male adult + indet. Subadult, **C**
Beech Hill House (1)	Perthshire	**Bone, burnt**	2196-1921 cal BC	**Cist**, 2m S of kerbed cairn	None	**Bone toggle**, quartz ball	2: young male adult + indet. Subadult, **C**
Bwlch y Rhiw (10)	Caernarvonshire	**Bone, burnt, axial fracture**	-	**Cist**	**CU (i)**	Awl	?, **C**
Galley Low (9)	Derbyshire	**Bone (cattle or horse), mostly intact**	2030-1880 cal BC	Grave pit within barrow	Food Vessel	flint flake, antler rod, ironstone	1: adult male (middle adult), I
Manton barrow, (Preschute G1a) (13)	Wiltshire	Amber, basal slot damaged,	-	Grave pit within barrow	**CU**, ?	Bronze knife-dagger blade; 2 cups, amber disc, 3 awls, beads, halberd pendant, ceramic lip plug (all "9 feet" from burial)	1: adult, female, I
Marian Bach (6)	Flintshire	**Bone or horn, mostly intact**	-	Pit, round cairn	**CU**	-	?, **C**
Merddyn Gwyn (5)	Anglesey	**Bone, burnt, axial fracture**	-	Barrow perimeter	**CU**/EFVU **(i)**	-	1: adult, female, **C**
Radwell barrow I (12)	Bedfordshire	**Bone, socket fractured**		Pit, in ring ditch	**CU (i)**	Awl, jet beads, amber beads, v-perforated amber button	2: adult ?male + adult ?female, **C**
Raunds barrow 1 (11)	Northamptonshire	Antler, **burnt**	1951-1703 cal BC	Pit within barrow (S of primary burial)	**CU**, upright	Bronze dagger blade (unburnt; no fit with pommel), bone pin (burnt)	2: adult ?male, 20-40 + 13-14 indet, **C**
Ringlemere (14)	Kent	Amber, intact	-	Barrow	(not in situ)	(not in situ – gold cup, amber pendant with gold trim)	-
River Thames (16)	Thames	Bronze, intact	-	river	-	-	-
Shaw cairn (8)	Greater Manchester	**Bone, burnt, socket fractured**	-	Kerbed round cairn	?	?	?
Staarvey Farm (3)	Isle of Man	**Bone (cattle or horse), burnt, socket fractured**	1956-1696 cal BC	**Cist**	**CU (i) (+2nd vessel)**	**Plano-convex flint knife, flint end scraper, bone beads, point, oblongs**	**4: 1 child, 1 adolesc., 2 adult (1 male), C**
Wilmslow (7)	Cheshire	**Bone,** ?	-	?	**CU (i)**	?	?, **C**
Winterbourne Stoke G4 (15)	Wiltshire	Antler or cetacean bone, intact	-	Pit, barrow	-	'Elm chest with bronze straps', Camerton-Snowshill knife-dagger, bone 'tweezers', **bone pin**	?, **C**
Winterbourne Stoke G9 (15)	Wiltshire	Amber, intact	-	Pit, barrow	?	?	?, **C**
Winterbourne Stoke G66 (15)	Wiltshire	Cetacean bone; damage to basal slot		Pit under barrow	**CU**, upright	Bronze knife-dagger blade, 'black' beads	?, **C**

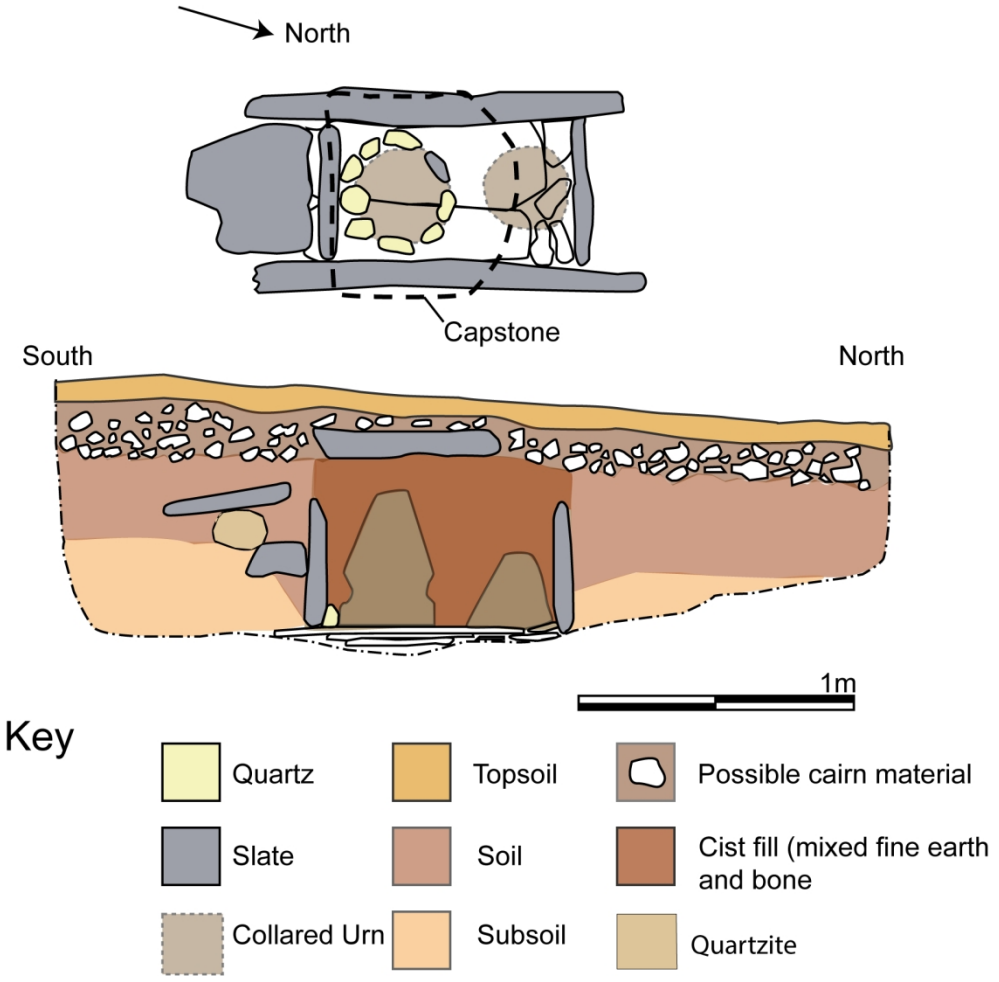

Figure 1: Cist burial at Staarvey Farm. Based on illustrations by Jenny Woodcock (1999). Image: R. Crellin.

Figure 2: Collared Urn from the Staarvey Farm cist. Image: R. Crellin, with permission of the trustees of Manx National Heritage.

266x280mm (300 x 300 DPI)

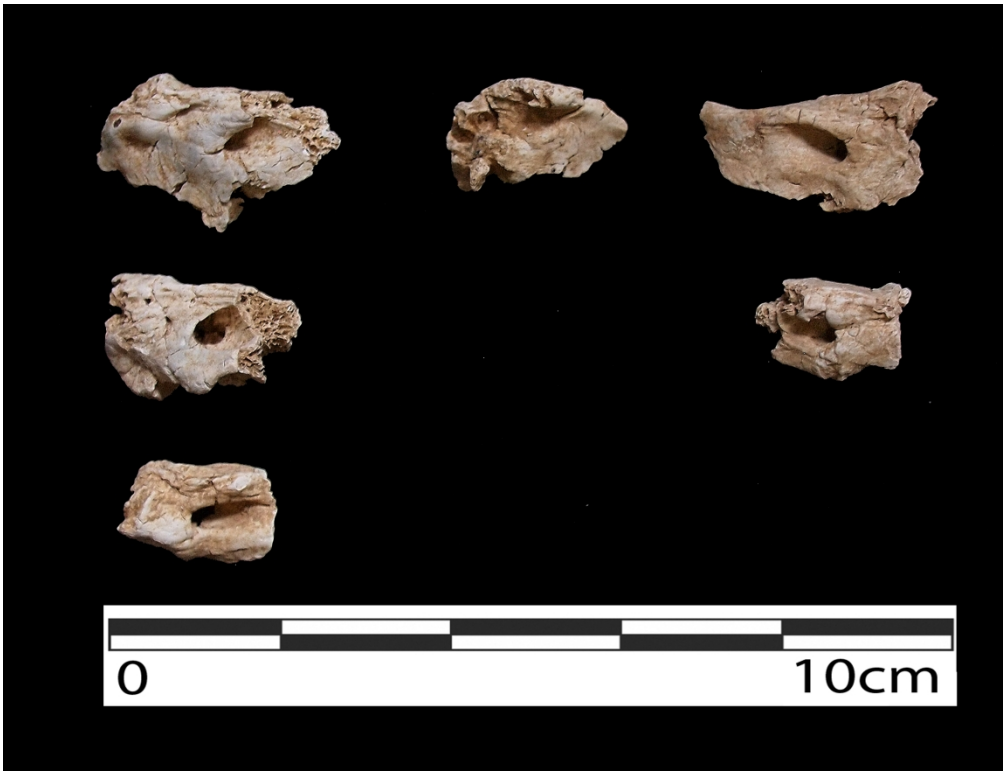

Figure 3: Petrous portions of the temporal bone from a minimum of 4 individuals. Image: M. Gamble, with permission of the trustees of Manx National Heritage.

309x237mm (300 x 300 DPI)

Figure 4: Class 3 bone pommel from Staarvey Farm. Scale 5cm. Image: R. Crellin, with permission of the trustees of Manx National Heritage.

297x319mm (300 x 300 DPI)

Figure 5: Bone bead (1983.0215.007a); bone bead (1983.0215.007b); bone toggle (1983-0215/0011 a); bone point (1983-0215/0001a-c) (left to right). Image: R. Crellin with permission of the Trustees of Manx National Heritage.

297x244mm (300 x 300 DPI)

Figure 6: Worked bone oblongs A-D (left to right). Image: R. Crellin with permission of the Trustees of Manx National Heritage.

375x192mm (300 x 300 DPI)

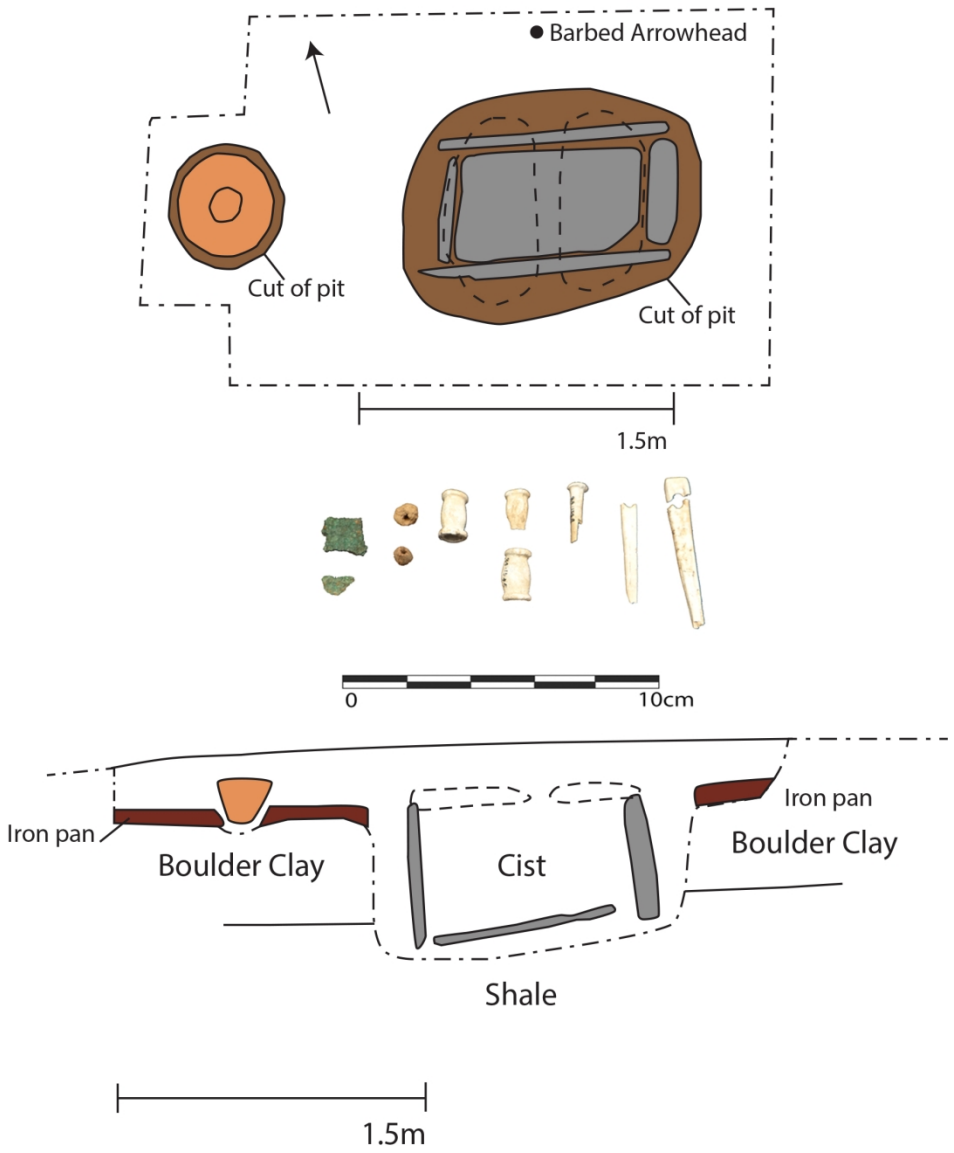

Figure 7: The burial features and artefacts from The Cronk, Upper Lherghydhoo. Based on illustrations by Jenny Woodcock (1996). Image: R. Crellin, with permission of the trustees of Manx National Heritage.

161x200mm (300 x 300 DPI)

Figure 8: Distribution of class 3 pommels, ceramics associated with class 3 pommels, and Collared Urns in cists. Vessel images from Longworth (1984), except Radwell (Hall & Woodward 1977) and Galley Low (Vine 1982). Image: C. Fowler & R. Crellin.

298x388mm (300 x 300 DPI)

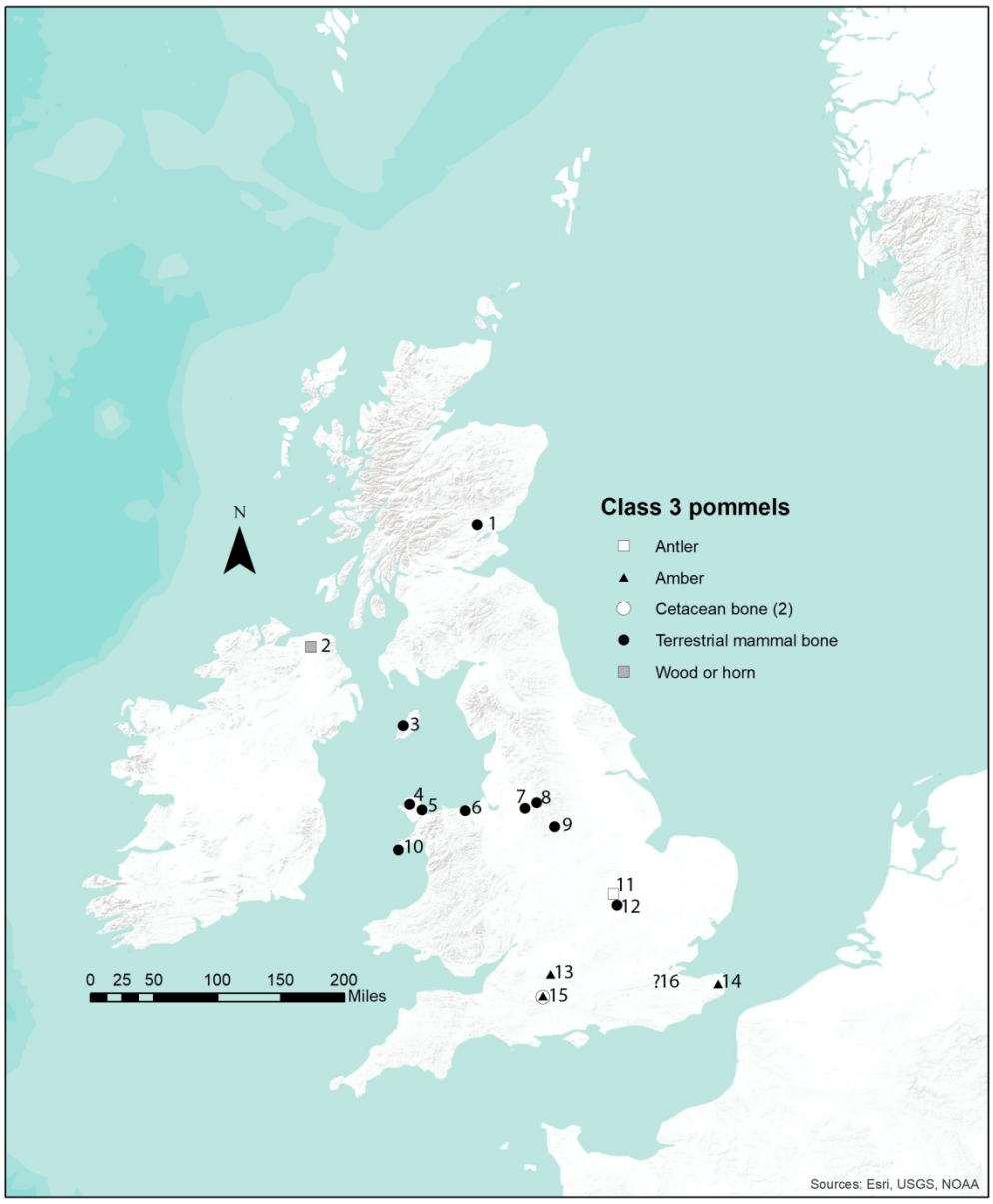

Figure 9: Distribution of class 3 pommels. See Table 1 for key to site numbers. Image: C. Fowler & R. Crellin.

210x253mm (300 x 300 DPI)

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Captions

Figure 1: Cist burial at Staarvey Farm. Based on illustrations by Jenny Woodcock (1999). Image: R. Crellin.

Figure 2: Collared Urn from the Staarvey Farm cist. Image: R. Crellin, with permission of the trustees of Manx National Heritage.

Figure 3: Petrous portions of the temporal bone from a minimum of 4 individuals. Image: M. Gamble, with permission of the trustees of Manx National Heritage.

Figure 4: Class 3 bone pommel from Staarvey Farm. Scale 5cm. Image: R. Crellin, with permission of the trustees of Manx National Heritage.

Figure 5: Bone bead (1983.0215.007a); bone bead (1983.0215.007b); bone toggle (1983-0215/0011 a); bone point (1983-0215/0001a-c) (left to right). Image: R. Crellin with permission of the Trustees of Manx National Heritage.

Figure 6: Worked bone oblongs A-D (left to right). Image: R. Crellin with permission of the Trustees of Manx National Heritage.

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Figure 9: Distribution of class 3 pommels. See Table 1 for key to site numbers. Image: C. Fowler & R. Crellin.

Online Supplementary Material

Contents

Further details on the Staarvey Farm cist

Staarvey Farm is located in the parish area of German. The cist was excavated in December 1947 by Basil Megaw on behalf of the Manx Museum after it was discovered during the course of ploughing. The slate cist was oriented north-northeast and consisted entirely of unmodified slate slabs with a slate floor (the predominant geology of the island); measurements are not precisely recorded but estimated to be c. 61 cm wide, c. 91 cm long and c.70 cm deep (Woodcock, 1999: 89). A fractured slate slab lying to the south was interpreted by Woodcock as part of the capstone that had been displaced. Below this slate slab was a quartzite stone placed parallel to the southern end-slab of the cist, and below this was a further horizontal slate stone with a flat side that appeared to have been wedged against the cist as if to support it (Woodcock, 1999: 89-90). The cist contained one intact inverted urn (IOMMM 7248) and a second highly eroded inverted urn (IOMMM 7247), both of which contained cremated bone. Cremated bone was also found elsewhere in the cist, beyond the south end slab of the cist (possibly spilling there when the cover slab was struck by the plough), and spread on the surface of the field nearby (likely associated with the discovery of the cist by the farmer) (ibid.).

Accession codes and dimensions for bone artefacts

All measurements are expressed as: length, width, thickness [where appropriate] and weight (in grams).

Pommel (Figure 4): Manx Museum 1983-0215/0005. 2.62 cm x 0.79 cm x 7.3 cm. Internal dimensions of socket 1.5 cm x 0.45 cm x 0.58 cm deep. Found among human remains in bag marked ‘Bones from cist’.

Bone point (Figure 5): Manx Museum 1983-0215/0001a–c. The maximum length of the joining parts is 8.89 cm with a maximum width of 0.57cm at the widest part. The point is perforated at the widest end with an oval hole (0.21 cm x 0.16cm) set within a wider sub-rectangular depression (0.4 cm deep x 0.53 cm). Found among human remains in bag marked ‘Staarvey bones’.

Four bone oblongs (Figure 6): Manx Museum 1983-0215/0010a–d. Bone oblong A: 2.86 cm x0.88 cm x .29 cm; 1.18g. Bone oblong B: 3.04 cm x 0.89 cm x 0.36; 1.41g. Bone oblong C: 2.84 cm x 0.91 c, x 0.32cm x 1.27g. Bone oblong D: 2.91 cm x 0.92 x 0.38 cm; 1.35g. All of the bone oblongs were found among human remains in bag marked ‘Staarvey bones’.

Fourteen bone beads: Bone beads MM1983.0215.007a–c: 1.74 cm x 1.02 cm; 0.29g. Bone bead MM1983.0215.007b (Figure 5): 1.66 cm x 0.84 cm; 0.14g. Bone bead MM1983.0215.007c: 0.12 x 9.6. Manx Museum 1983-0215/0011a–k: Bone toggle (Figure 5):

MM1983-0215/0011a. 1.1 cm x 1.09 cm; 0.31g; perforation is 0.22 cm in diameter. Bone bead MM1983-0215/0011b 1.35 cm x 1.24 cm; 0.58g. MM1983-0215/0011c. 0.13 cm x 1.04 cm; 0.46g. MM1983-0215/0011d–k are each smaller than 1 cm x 0.7 cm.

Potentially worked human bone fragments

It is not clear whether these have been worked into shapes or have fragmented in these shapes during the cremation process.

1. Burned 'bone disc' (previously recorded as unburned by Woodcock 1999: 95)

2. Sub-circular cranial fragment (adult) with sutures visible and partially fusing, ectocranial layer mostly missing, slightly curved endocranially, burned white with some cracking and blue staining (28.0 mm x 26.1mm x 3.3mm – from 'Staarvey bones')

3. Crescent-shaped fragment of cranium with smoothed edges (2.40 cm x1.01 cm x0.30 cm – from 'Bones from Cist').

Figure S1: Top left is #1 bone disc found by Woodcock (1999), top right is #2 bone disc found during sieving, bottom left is #3 crescent shaped bone.

Osteological summary

A full osteological report prepared by Dr Michelle Gamble is lodged with Manx National Heritage; what follows summarises key details from that report and reflects further on the processes of cremation and commingling for the human remains from the cist at Staarvey Farm.

Context

All the skeletal material from Staarvey Farm, Isle of Man, was examined at the Manx Museum in October 2016 and is stored there in a purpose-built osteological storeroom (Accession Numbers: 1954-7248 and 1983-0215 from boxes 1935 and 1687).

The majority of the skeletal material derives from within the cist, according to the excavation records as interpreted by Jenny Woodcock (1999: 89-90). The excavators determined that the bones were not likely concentrated in any one part of the cist, but had naturally accumulated at the corners where there was the most space. There was also bone material described as spilled beyond a stone slab at the south end of the cist, but this was either not kept as a separate context and included within the main bulk of bones from within the cist, or it was not kept at all (Ibid. 89). The majority of the cremated bone is described as coming from in or around the intact inverted Collared Urn (IOMMM 7247). There was a second, less well-preserved inverted urn from in the north end of the cist which also contained burned bone (IOMMM 7248). Finally, Woodcock describes fragments of bone which were recovered from the surface of the field which were disturbed by ploughing and/or placed there by the finder of the cist and so also originally came from within the cist. This final group seems to have been mixed in with the larger collection of bones during recovery.

It was hoped that perhaps the bones could be separated into excavation contexts based on how they were bagged and labelled. The majority of the skeletal material in five large bags, three of which were labelled ‘Staarvey’ and two of which were labelled ‘Bones from Cist’ (Figure S2). There is no further documentation to guide an assessment of what the two labels indicate about the locations in which the bones were found. While the bones were bagged and stored with two different labels, there were joins of bone fragments across these bags, and thus there is a high degree of commingling. The mixing of skeletal material across these two labels and the lack of excavation notes regarding the labels on the bags means that there is no way to re-associate any group of bones with any particular location within the burial feature, barring the skeletal material which was recovered mixed with the pottery sherds from the second urn (IOMMM 7248). The three possible contexts of bones within this cist were kept separate for the analyses, but all the remains from this burial can be considered as a single context, as there was clearly mixing of material, and no conclusive method of determining which collection of skeletal material came from which part of the burial, if indeed they were separate at all.

Figure S2: Bags containing all the skeletal material from 'Staarvey' and 'Bones from Cist' – as they were found in Box 1687. Note some possible sorting by size of bone fragment.

Methods

The methods of observation and analysis of the human remains in this report are in agreement with the recommendations from Buikstra and Ubelaker (1994) and McKinley (2004). Observations were recorded for cremated skeletal material from a single context in a detailed inventory (see Table S1 below for abbreviated version).

Standard age and sex assessment scales were used where the fragmentation and preservation of the particular skeletal elements permitted (i.e. Buikstra and Ubelaker 1994; Moorrees et al. 1963; Schaefer, Black and Scheuer 2009; White and Folkens 2000 from Ubelaker 1989). In particular, the preservation of particular skeletal fragments such as the mandible or maxilla (with alveoli present) can be indicative of more accurate age ranges.

Burning of skeletal material can cause a number of observable changes to the morphology and structure of the bones and teeth. As noted above, the bone can change colour based on the temperature and length of exposure to the heat source. Bones which are black have been exposed to a lower temperature or high heat for a short period of time, and bones which are white or blue-grey have been subject to high heat, or lower heat for a long period of time. The loss of water in the bone can cause it to shrink and warp, which may also cause changes to the bone surface, including longitudinal and transverse checking and curved cracks. Long bones will tend to split apart in a longitudinal manner (as if twisted apart into fragments) and the enamel on teeth will shatter. This last action, severely limits the amount and nature of information which can be derived from the teeth of cremated skeletons (i.e. with no crowns it is impossible to identify the tooth, discuss pathology or age assessments). In regards to deliberate fragmenting to the burned skeletal material, there are still some debates. It would seem that even the action of collecting the cremated bone can cause high levels of fragmentation and perhaps in archaeological cases where the bone is highly

fragmentary the intention of the action cannot be determined. It can simply be noted that the levels of fragmentation are quite high and possibly reflect movement of the material to cause significant levels of damage to the bone structure.

In regards to burning of skeletal material, there have been a number of studies which are summarised by Ubelaker (2009) (and further discussed in the more recent publication by Thompson 2015) indicating that there are a number of variables which can affect the appearance of burned bone. Colour change and structural changes such as warping, shrinkage, longitudinal splitting and transverse cracking all are used as indicators for aspects of the burning such as the temperature of fire, whether the bones were dry or fleshed and the length of thermal application. Experiments seem to indicate that dry bones tend to display less variation in fracture pattern and more transverse checking while fleshed bones tend to display more warping, more variation in longitudinal splitting and transverse fractures frequently in a curvilinear pattern (Ubelaker 2009:3).

In general, for the cremated skeletal material, an inventory was compiled to assess the number of individuals present and suggest the proportion of the skeleton present. This was achieved through weighing the skeletal material and determining if there are duplicate elements present.

The skeletal material all required some sieving and sorting to separate it from some of the excavation soil. Iit did look as though a preliminary separation of bigger elements has occurred, though whether this was just an artefact of excavation collection (or later re-bagging at the museum) or a true representation of the original deposition of the bones is impossible to tell. The cleaning of the skeletal material was accomplished using dry brushes and wooden tools. The skeletal material was separated into larger portions which could be identified and sided, fragments which could be determined to be a ‘long bone’ and indeterminate bone which included fragments which were too small or too warped to identify. There is a portion of small bone fragments which could not be separated from the general soil detritus.

Results

1983-0215 ‘Bones from Cist’ (Box 1935)

The ‘Bones from Cist’ (1983-0215) are very white-cream with a mix of sizes from quite large fragments to tiny ones, there is a group of bones within this sample that are very water-worn which could either reflect a deposit which was in there for a longer period of time and exposed to water action or is in a portion of the cist which was affected by water movement. The pre-sieved weight of the 2 bags was: 467.01g +375.43g = 842.44g.

The MNI of this sample is 3 based on the left petrous portion. There is at least one infant/child likely based on the size of some of the material. The MNI is supported by 2 right adult mandibular condyles and 2 right mandibular body fragments, as well as 2 dens fragments from the second cervical vertebrae. There is no diagnostic subadult material, but given the size of the long bone fragments, it is likely a neonate-3y (on the older end of that range, c. 1–3 years old at death). The overall weight of the cremation is 735.1g. 1 unsided metacarpal displays a rough surface which may reflect a healed trauma but the burning process has made it difficult to be certain.

1983-0215 ‘Staarvey’ (Box 1935)

The ‘Staarvey’ (1983-0215) bones are slightly more white-grey, there are some larger bone fragments and 2 large bags of small fragments The 3 bags have a pre-cleaning weight of: 1790.3g +952.3g + 825.1g = 3567.7g. Once again with this collection there are a small group of bones which are water-worn and eroded.

The MNI of this sample is 3 based on variations in cranial thickness, 3 left mandibular condyles and unfused long bone epiphyses. There is 1 adult male based on the right frontal rim, which may also be associated with the thicker cranial vault material with substantial amount of shearing off of the two layers of cortical bone from the diploe. Based on the general size and unfused long bone epiphyses (left proximal humerus and unsided proximal radius), there is one adolescent present aged 10–15 years at death. The overall weight of the cremation is 2461.8g. Again, the cremation process makes pathological assessment difficult, but several calvarial fragments displayed possible microporosity on the ectocranial surface which may reflect a general mineral or nutritional deficiency; and the distal epiphyses of an unsided intermediate foot phalanx is remodeled to be angled laterally, likely due to use.

1954-7248 (Box 1687)

Approximately >5% of a cremated adult skeleton, for whom age and sex could not be assessed. The total weight of the burial was 71.50g. There were no pathological changes observed on any of the skeletal material.

Combined results

Overall, there were 165 data entries of osteological material from Staarvey, 152 of which were identifiable portions of the human skeleton (the rest constituted of unidentifiable fragments, typically by weight). The heavy fragmentation and the significant warping and cracking has made discussion of pathological changes difficult. The remains consist of a minimum of 4 cremated individuals. There are at least 2 adults, one of which is a male based on a supra-orbital rim fragment and general robusticity of several cranial fragments; 1 adolescent aged 10–15 years at death and an infant/child, aged between 1–3 years at death. There is limited material from this infant/child and no duplication of bones that it makes it difficult to be certain. In general, the mandible and the petrous proved best for assessing the MNI. Note that all the diagnostic fragments of bone were compared across the two groups to ensure no double counting for MNI. Portions of all parts of the body were recovered suggesting that the individuals buried here were burned as complete skeletons, particularly given the number of hand and foot phalanges recovered. The majority of the tiny bone fragments are within the ‘Staarvey’ sample.

All the skeletal material was calcined white, with slight variations towards creamy-white or grey-white, which could be due to different burning events or more likely due to soil conditions within the cist (Figure S3). All the material showed significant warping, cracking, transverse checking and longitudinal fracturing. It was highly fragmented with relatively few large pieces and minimal diagnostic material for the minimum of 4 individuals present.

Figure S3: Fragments of femora. The collection on the top is from the 'Staarvey' sample and the collection on the bottom is from the 'Bones from Cist' sample. Note the slight differences in colour and the differences in size of the two femoral necks.

Discussion

As the minimum number of individuals across the burial is 4, and a total cleaned osteological weight of 3268.4g, it is possible that the majority of the skeletal material of the individuals interred here are present. The average weight of a modern adult cremation is 876–3784g, with males all over 2750g and all females under 1887g (Warren and Maples 1997). Therefore, with a bone weight of 3268.4g for four individuals, it is unlikely that 100% of the skeleton of each individual is present. That being said, as other studies show (i.e. Bass and Jantz 2004; McKinley 1994; van Deest et al. 2011) there is variation in weight of cremated individuals. Given that one individual is an infant and the other an adolescent, and there are questions regarding the survivability of infant remains (i.e. Jaeger and Johansen 2013), the recovered weight, coupled with the presence of small fragments of teeth and phalanges, suggests fairly good recovery of the remains both from the pyre to the cist, and from the excavation. It is difficult to determine the percentage of each individual present as separating the majority of the skeletal material into individuals is not possible.

It is relatively unusual for Early Bronze Age cremation deposits containing the remains of more than one individual to be identified, but the practice might have been more common than a simple review of site reports would suggest (McKinley 1997: 130, 142–3; Fowler 2013: 166–7; Brück 2019: 36). McKinley (1997: 130) estimated at least 5% of cremations were of multiple individuals, though this was based on 'multi-period' data (130 of her c.4000 cases were dated to the Early Bronze Age). Fowler's review of 159 recorded cases of Early Bronze Age burials of cremated remains in Northeast England identified 21 reports of more than one individual, of which 11 were the remains of multiple individuals buried in the same vessel — but stressed that this is likely to under-represent the proportion of multiple cremation deposits given that the records stretch back to the early nineteenth century and earlier records seldom include detailed osteological assessments (Fowler 2013: 166–7). The

vast majority of the sources for Early Bronze Age north-east England reporting multiple individuals record 2 MNI, but there is one example of 4 MNI buried in the same Collared Urn at Kirkhill, Northumberland (Miket 1974). The vessel was inverted in an oval pit, oriented north-south. Here the four sets of bones were heavily intermixed within the vessel, and came from three adults and one older child or adolescent. The only artefacts were two flint flakes and the bones and soil within the urn were described as free from charcoal. There are six other known cases of Early Bronze Age burials on the Isle of Man containing cremated remains of more than 1 MNI (Crellin et al. in prep). Across Britain, combinations of adult and child predominate in Early Bronze Age cremation deposits but this may be due to a detection bias in that differences in the size of bones is likely to have been a key indicator of multiple individuals, or have stimulated closer inspection of remains, prior to the development of contemporary osteological techniques (Petersen et al. 1974: 49). Bone was reported as present in both vessels at Staarvey Farm but since it is not known which bones came from which vessel it is impossible to identify the MNI present in each vessel. If each vessel had contained two individuals this might or might not have been particularly unusual; if each vessel contained parts of 3 or 4 MNI that might be more unusual. It is worth noting that four other burials with class 3 pommels across Britain also contained the cremated remains of multiple individuals (see Table 1). This is a relatively high proportion of the overall number of burials with class 3 pommels with detailed reports on the cremated bone — indeed, of all the burials with cremated remains only Merddyn Gwyn conclusively reports a MNI of 1.

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Table S1: Bone elements from Staarvey Farm

Table description: bone element, side (L = left, R = right, A = axial, U = un-sided), the segment of the skeletal element present (Buikstra and Ubelaker's (1994) abbreviations are employed to record the segment present (PE = proximal epiphysis, P1/3 = proximal third of the diaphysis, M1/3 = middle third of the diaphysis, D1/3 = distal third of the diaphysis, DE = distal epiphysis, Pend = un-fused proximal end, Dend= un-fused distal end)), the number of fragments or the weight, the completeness score ('Comp' – the percentage of a bone element present using the scores from Buikstra and Ubelaker 1994: where 1 = <25%, 2 = 25–50% , 3 =51–75%, 4= >75% and 5 = 100%). . The nature of the surface texture as affected by burning process is recorded (L= Longitudinally Split; T= Longitudinal and Transverse Checking; C= Cracking and W= Warping) and the colour (T = Tan; B= Black and W= White/Blue–Grey). The age category (Age Cat.) refers to the age group which the bones appear to derive from (General subadult = 9; General adult = 8; Senior Adult (50+) = 7; Adult (36–50) = 6; Young Adult (21–35) = 5; Adolescent (13–20) = 4; Child (4–12) = 3; Infant (neonate – 3 yr) = 2; Prenatal (foetus) = 1).

Bag	Accession	Bone	Side	Segment	No Frags/ weight	Comp	Crem	Col	Age Cat.
from cist'	1983-0215	Calvarium	A		115.15g	2	W, C, T	W	
	1983-0215	Calvarium	A		290.72g	2	W, C, L, T	W, G, B	
cordoned	1954-7248	Cranium	A		30	1	W, C, T	W	
	1983-0215	Endocranial bone	A	sphenoid	19	1	W, C, T	W	
from cist'	1983-0215	Frontal	A	R + L rims	2	2	W, C, T	W	9
from cist'	1983-0215	Frontal	A	squama	4	1	W, C, T	W	8
	1983-0215	Frontal	A	R rim and ridge	1	1	W, C, T	W, G	8
	1983-0215	Frontal	A	squama	4	1	W, C, T	W, G	
	1983-0215	Hyoid	A	body	1	3	W, C	W	8

Bag	Accession	Bone	Side	Segment	No Frags/ weight	Comp	Crem	Col	Age Cat.
from cist'	1983-0215	Mandble	A	body	9	1	W, C, L, T	W	
	1983-0215	Mandible	A	body	12	1	W, C, T	W	
	1983-0215	Mandible	L	condyle with neck	1	1	W, C, T	W	8
	1983-0215	Mandible	L	condyle with neck	1	1	W, C, T	W	8
	1983-0215	Mandible	L	condyle	1	1	W, C, T	W	9
from cist'	1983-0215	Mandible	R	condyle, coronoid, gonial	2	2	W, C, L, T	W	
from cist'	1983-0215	Mandible	R	condyle, body with alveoli	2	1	W, C, L, T	W	
from cist'	1983-0215	Mandible	R	body with alveoli	2	1	W, C, L, T	W	
	1983-0215	Mandible	R	coronoid	1	1	W, C, T	W, G	8
	1983-0215	Mandible	R	condyle and extramolar sulcus	2	1	W, C, T	W, G	8
	1983-0215	Maxilla	A	alveoli	7	1	W, C, T	W	
from cist'	1983-0215	Maxilla	L	frontal proc	1	1	W, C, T	W	9
from cist'	1983-0215	Maxilla	R	frontal proc	1	1	W, C, T	W	8
from cist'	1983-0215	Maxilla	U		5	1	W, C, T	W	
from cist'	1983-0215	Occipital	A	squama	3	1	W, C, T	W	8
	1983-0215	Occipital	A	cruciform and protuberance	4	1	W, C, T	W, G	8
from cist'	1983-0215	Temporal	L	petrous	1	1	W, C, T	W	
from cist'	1983-0215	Temporal	L	petrous	1	1	W, C, T	W	
from cist'	1983-0215	Temporal	L	petrous	1	1	W, C, T	W	
	1983-0215	Temporal	L	petrous	1	1	W, C, T	W	
from cist'	1983-0215	Temporal	R	articular eminence	1	1	W, C, T	W	8
from cist'	1983-0215	Temporal	R	articular eminence	1	1	W, C, T	W	9
	1983-0215	Temporal	R	petrous	1	1	W, C, T	W	
	1983-0215	Temporal	R	petrous	1	1	W, C, T	W	
from cist'	1983-0215	Temporal	U	body, matsoid and zyg proc	18	1	W, C, T	W	
	1983-0215	Temporal	U	ext aud meatus, petrous, zyg proc, mastoid	24	2	W, C, T,	W, G	
from cist'	1983-0215	Zygomatic	L	frontal process	1	3	W, C, T	W	8
	1983-0215	Zygomatic	L	frontal process	1	2	W, C, T	W	
	1983-0215	Zygomatic	L	frontal process	2	1	W, C, T	W	
cordoned	1954-7248	Man I	U	root	1	2			
from cist'	1983-0215	Root	U	root	6	2			
	1983-0215	Root	U	multi-roots	11	2			
	1983-0215	Root	U	single root	17	2			
from cist'	1983-0215	C1	A	art facet with C2	1	1	W, C, T	W	
	1983-0215	C1	A	L sup and inf art facet	1	1	W, C, T	W	
	1983-0215	C1	A	inf art facet and pedicle	2	2	W, C, T	W	
cordoned	1954-7248	C2	A	L sup facet	1	1	W, C, T	W	
from cist'	1983-0215	C2	A	dens and art facet	2	2	W, C, T	W	
from cist'	1983-0215	C2	A	dens and body	1	2	W, C, T	W	
from cist'	1983-0215	Cervical vert	A	body	2	2	W, C, T	W	
cordoned	1954-7248	Vertebrae	A	sp, body and facets	8	1	W, C, T	W	

Bag	Accession	Bone	Side	Segment	No Frags/ weight	Comp	Crem	Col	Age Cat.
from cist'	1983-0215	Vertebrae	A	bodies, laminae, pedicles, facets	41	1	W, C, T	W	
	1983-0215	Vertebrae	A	facets, laminae, pedicles, 1 body	98	1	W, C, T	W	
from cist'	1983-0215	Clavicle	U	shaft	5	1	W, C, L, T	W	
	1983-0215	Clavicle	U	M1/3	8	1	W, C, T	W, B	
	1983-0215	Humerus	L	PE	1	1	W, C, T	G	4
cordoned	1954-7248	Humerus	U	diaphysis	12	1	W, C, L, T	W	
from cist'	1983-0215	Humerus	U	diaphysis	63.08g	1	W, C, L, T	W	
	1983-0215	Humerus	U	diaphysis	31	1	W, C, L, T	W, G	
	1983-0215	Humerus	U	DE	1	1	W, C, L, T	G	
from cist'	1983-0215	Radius	U	PE, P1/3, diaphysis	3	2	W, C, L, T	W	8
	1983-0215	Radius	U	PE	1	1	W, C, L, T	W, G	4
	1983-0215	Radius	U	diaphysis	9	1	W, C, L, T	W, G	
from cist'	1983-0215	Scapula	L	glenoid	1	1	W, C, T	W	8
	1983-0215	Scapula	L	neck	1	1	W, C, T	W, G	8
from cist'	1983-0215	Scapula	U	neck	2	1	W, C, L, T	W	
	1983-0215	Scapula	U	neck, spine	5	1	W, C, T	W, G	
	1983-0215	Ulna	R	PE	1	1	W, C, L, T	T, W	
from cist'	1983-0215	Ulna	U	diaphysis	3	1	W, C, L, T	W	
from cist'	1983-0215	Ulna	U	Dend	1	1	W, C, T	W	9
	1983-0215	Ulna	U	D1/3, diaphysis	11	1	W, C, L, T	W, G	
cordoned	1954-7248	Ulna/Radius	U	diaphysis	9	1	W, C, L, T	W	
from cist'	1983-0215	Ulna/Radius	U	diaphysis	53	1	W, C, L, T	W	
	1983-0215	Ulna/Radius	U	diaphysis	50	1	W, C, L, T	W, G	
	1983-0215	1st Distal hand phalanx	U	PE-DE	1	4	W, C, L, T	W	
	1983-0215	1st Distal hand phalanx	U	PE-DE	1	4	W, C, L, T	W	
	1983-0215	1st proximal hand phalanx	U	M1/3-DE	1	2	W, C, L, T	W	
	1983-0215	Carpal	U		1	2	W, C, L, T	W	
cordoned	1954-7248	Distal hand phalanx	U	PE-DE	1	4	C	T, W	
cordoned	1954-7248	Distal hand phalanx	U	PE-DE	2	4	C	T, W	
	1983-0215	Distal hand phalanx	U	PE-DE	1	4	W, C, L, T	W	
	1983-0215	Distal hand phalanx	U	PE-DE	1	4	W, C, L, T	W	
	1983-0215	Distal hand phalanx	U	PE-D1/3	1	3	W, C, L, T	W	
	1983-0215	Distal hand phalanx	U	PE-M1/3	1	2	W, C, L, T	W	
	1983-0215	Distal hand phalanx	U	DE	1	2	W, C, L, T	W	
	1983-0215	Hand Phalanx	U	P1/3-DE	1	3	W, C, L, T	W	
	1983-0215	Hand Phalanx	U	M1/3-DE	1	2	W, C, L, T	W	
	1983-0215	Hand Phalanx	U	M1/3-DE	1	2	W, C, L, T	W	
	1983-0215	Hand Phalanx	U	M1/3-DE	1	2	W, C, L, T	W	
	1983-0215	Hand Phalanx	U	M1/3-DE	1	2	W, C, L, T	W	
	1983-0215	Hand Phalanx	U	M1/3-DE	1	2	W, C, L, T	W	

Bag	Accession	Bone	Side	Segment	No Frags/ weight	Comp	Crem	Col	Age Cat.
	1983-0215	Hand Phalanx	U	M1/3-DE	1	2	W, C, L, T	W	
	1983-0215	Hand Phalanx	U	M1/3-DE	1	2	W, C, L, T	W	
	1983-0215	Hand Phalanx	U	M1/3-DE	1	2	W, C, L, T	W	
	1983-0215	Hand Phalanx	U	Pend-D1/3	1	3	W, C, T	W	4
	1983-0215	Hand Phalanx	U	Pend-D1/3	1	3	W, C, T	W	4
	1983-0215	Hand Phalanx	U	Pend-D1/3	1	3	W, C, T	W	4
cordoned	1954-7248	Indet carpal	U		1	2	C	T, W	
from cist'	1983-0215	Indet MC	U	M1/3-D1/3	1	3	W, C, L, T	W	8
from cist'	1983-0215	Indet MC	U	M1/3	1	1	W, C, L, T	W	8
from cist'	1983-0215	Intermediate hand phalanx	U	PE-DE	1	4	W, C, T	W	8
from cist'	1983-0215	Intermediate hand phalanx	U	PE-DE	2	3	W, C, T	W	8
from cist'	1983-0215	Intermediate hand phalanx	U	Pend-DE	1	4	W, C, T	W	9
	1983-0215	Intermediate hand phalanx	U	PE-DE	1	4	W, C, L, T	W	
	1983-0215	Intermediate hand phalanx	U	PE-DE	1	4	W, C, L, T	W	
	1983-0215	Intermediate hand phalanx	U	PE-DE	1	2	W, C, L, T	W	
from cist'	1983-0215	Lunate	U		1	3	W, C, T	W, G	9
	1983-0215	MC1	U	PE, DE	2	1	W, C, L, T	W	
from cist'	1983-0215	Proximal hand phalanx	U	D1/3-DE	1	2	W, C, L, T	W	8
from cist'	1983-0215	Proximal hand phalanx	U	D1/3-DE	1	2	W, C, L, T	W	8
from cist'	1983-0215	Proximal hand phalanx	U	D1/3-DE	1	2	W, C, L, T	W	8
from cist'	1983-0215	Proximal hand phalanx	U	M1/3	1	2	W, C, L, T	W	8
	1983-0215	Proximal hand phalanx	U	P1/3-DE	1	2	W, C, L, T	W	
	1983-0215	Proximal hand phalanx	U	M1/3-DE	1	2	W, C, L, T	W	
	1983-0215	Proximal hand phalanx	U	DE	1	1	W, C, L, T	W	
from cist'	1983-0215	2nd Rib	R	shaft	1	3	W, C, L, T	W	
cordoned	1954-7248	Ribs 3-10	U	shafts	2	1	C	T, W	
from cist'	1983-0215	Ribs 3-10	U	shafts	35	1	W, C, L, T	W	
from cist'	1983-0215	Ribs 3-10	U	shaft	1	1	W, C, T	W	9
	1983-0215	Ribs 3-10	U	shafts	56	1	W, C, T	W	
from cist'	1983-0215	Os Coxa	L	sciatic notch	1	1	W, C, L, T	W	
from cist'	1983-0215	Os Coxa	R	sciatic notch	1	1	W, C, L, T	W	
cordoned	1954-7248	Os Coxa	U	ramus, iliac crest	3	1	C, T	W	
from cist'	1983-0215	Os Coxa	U	ilium, ischium	29	1	W, C, L, T	W	
	1983-0215	Os Coxa	U	ilium, ischium	50	1	W, C, L, T	W, G	
	1983-0215	Femur	L	P/13	1	1	W, C, L, T	W, G	4
cordoned	1954-7248	Femur	U	diaphysis	5	1	W, C, L, T	W	
from cist'	1983-0215	Femur	U	P1/3, diaphysis, DE	39	1	W, C, L, T	W	
	1983-0215	Femur	U	diaphysis	27	1	W, C, L, T	W, G	

Bag	Accession	Bone	Side	Segment	No Frags/ weight	Comp	Crem	Col	Age Cat.
cordoned	1954-7248	Fibula	U	diaphysis	2	1	W, C, L, T	W	
from cist'	1983-0215	Fibula	U	diaphysis	18	1	W, C, L, T	W	
	1983-0215	Fibula	U	diaphysis	24	1	W, C, L, T	W, G	
	1983-0215	Patella	U	sup and ant	2	1	W, C, T	W, G	
cordoned	1954-7248	Tibia	U	PE, diaphysis	3	1	W, C, L, T	W	
from cist'	1983-0215	Tibia	U	diaphysis	29	1	W, C, L, T	W	8
	1983-0215	Tibia	U	PE, DE, diaphysis	39	1	W, C, L, T	W, G	
	1983-0215	1st proximal foot phalanx	U	D1/3	2	1	W, C, L, T	W	
from cist'	1983-0215	Indet MT	U	P1/3-D1/3	1	3	W, C, L, T	W	8
from cist'	1983-0215	Indet MT	U	DE	1	1	W, C, L, T	W	8
	1983-0215	Indet MT	U	DE	1	1	W, C, T	W	
	1983-0215	Indet MT	U	DE	1	1	W, C, T	W	
	1983-0215	Indet MT	U	DE	1	1	W, C, T	W	
	1983-0215	Indet MT	U	DE	1	1	W, C, T	W	
	1983-0215	Indet MT	U	DE	1	1	W, C, T	W	
	1983-0215	Indet MT	U	DE	1	1	W, C, T	W	4
	1983-0215	Indet MT	U	D1/3	1	1	W, C, T	W	
	1983-0215	Intermediate foot phalanx	U	PE-DE	1	4	W, C	W	8
	1983-0215	MT1	L	M1/3-DE	1	2	W, C, L, T	W	8
cordoned	1954-7248	Proximal foot phalanx	U	P1/3-DE	1	2	W, C, L, T	W	
	1983-0215	Proximal foot phalanx	U	D1/3-DE	1	2	W, C, L, T	W	
	1983-0215	Proximal foot phalanx	U	D1/3-DE	1	2	W, C, L, T	W	
	1983-0215	Proximal foot phalanx	U	D1/3-DE	1	2	W, C, L, T	W	
cordoned	1954-7248	Indet bone	U		70	1	W, C, L, T	W	
from cist'	1983-0215	Indet bone	U		106.85g	1	W, C, L, T	W	
	1983-0215	Indet bone	U		785.3g	1	W, C, L, T	W, G, B	
	1983-0215	Indet epiphyses	U		3	1	W, C, L, T	W, G	9
from cist'	1983-0215	Indet epiphyses /tarsal	U	articular surfaces	12	1	W, C, L, T	W	
	1983-0215	Indet epiphyses /tarsal	U		56	1	W, C, T	W, G	
cordoned	1954-7248	Indet MC or MT	U	diaphysis	5	1	C, L	T, W	
from cist'	1983-0215	Indet MC or MT	U	diaphysis	8	1	W, C, L, T	W	
	1983-0215	Indet MC or MT	U	diaphysis	18	1	W, C, L, T	W	
from cist'	1983-0215	Long bone	U	diaphysis	13	1	W, C, L, T	W	9
from cist'	1983-0215	Long bone	U	diaphysis	54.61g	1	W, C, L, T	W	
	1983-0215	Long bone	U	Pend or Dend	2	1	W, C, L, T	W, G, B	9
	1983-0215	Long bone	U	diaphysis	418.62g	1	W, C, L, T	W, G	
	1983-0215	Sesamoid	U		1	4	W, C	W	

Table 1: Burials with Class 3 bone pommels (expanded version). Sites from central Britain and the Isle of Man highlighted grey. All dates are calibrated to 95.4% probability using OxCal v3.4.2 with IntCal 13.

Site (Number on Fig 9)	Region (NGR)	Material	Condition	C14 dates	Feature /site	Associated vessels	Other associated artefacts	MNI, age, sex, cremation/ inhumation	Site report/ osteological data
Balleymoney, Ireland (2)	Antrim, NW1184	Wood or horn?	Intact	-	bog	-	-	-	Woodward et al. 2015
Bedd Branwen (burial B), Anglesey (4)	Anglesey, SH36158498	**Bone**	**Burnt**	3257±80 BP [BM-455]; 1742–1322 cal BC	Pit, edge of ring cairn	**Collared Urn**/EFVU, **inverted**	Hone	1: adult male (osteoarthr), **C**	Lynch 1971
Bedd Branwen (burial H), Anglesey (4)	Anglesey, SH36158498	**Bone**	**Burnt, axial fracture**	3520±30 BP [GrA-19652]; 1929–1753 cal BC	Cist	**Collared Urn, inverted**	**Bone bead**, 6 amber beads, 4 jet beads	2: young male adult + indet. Subadult, **C**	Lynch 1971
Beech Hill House (1)	Perthshire, NO22014040	**Bone**	**Burnt**	3665±45 BP [GrA-19426]; 2196–1921 cal BC	**Cist**, 2m S of kerbed cairn	None	**Bone toggle**, quartz ball	2: young male adult + indet. Subadult, **C**	Stevenson et al., 1995
Bwlch y Rhiw / Rhiuw-with-Llanfaelrhys (10)	Caernarvonshire, SH2227	**Bone**	**Burnt**	-	**Cist**	**Collared Urn, inverted**	Awl	?, **C**	Savory 1980
Galley Low (9)	Derbys., SK21805649	**Bone (cattle or horse)**	Mostly intact	2030–1880 cal BC	Grave pit within barrow	Food Vessel	flint flake, antler rod, ironstone	1: adult male (middle adult), I	Bateman 1848; Parker Pearson et al. 2019: 143, 146
Manton barrow, (Preschute G1a) (13)	Wiltshire, SU16496912	Amber	Basal slot damaged, mostly intact	-	Grave pit within barrow	**Collared Urn**, ?	Bronze knife-dagger blade; 'Grape cup', gold-bound amber disc, perforated cup, 3 awls, beads, halberd pendant with haft set in sheet gold, ceramic lip plug (all "9 feet" from burial)	1: adult, female, I	Cunnington 1907
Marian Bach (6)	Flintshire, SJ0777	**Bone or horn**	Mostly intact	-	Pit, round cairn	**Collared Urn**	-	?, **C**	Savory 1980
Merddyn Gwyn (5)	Anglesey, SH5278	**Bone**	**Burnt?, axial fracture**	-	Barrow perimeter	**Collared Urn**/EFVU, **inverted**	-	1: adult, female, **C**	Hughes 1908
Radwell barrow I (12)	Bedfordsh. TI0157	**Bone**	**Socket fractured**		Pit, in ring ditch	**Collared Urn, inverted**	Awl, jet spacer plate, 94 jet disc beads, 13 jet barrel beads, amber spacer plate bead, 9 amber barrel beads, v-perforated amber button	2: adult ?male + adult ?female, **C**	Hall & Woodward 1977
Raunds barrow 1, f30017, Irthlingborough (11)	Northants.SP9 6237126	Antler	**Burnt**	3520+40 BP [GrA-22378]; 1951–1703 cal BC	Pit within barrow (S of primary burial)	**Collared Urn**, upright	Bronze dagger blade (unburnt; no fit with pommel), bone pin (burnt)	2: adult ?male, 20–40 + 13–14 indet, **C**	Harding & Healy 2007
Ringlemere (14)	Kent, TR29385698	Amber	Probably dep. intact	-	Barrow	(not in situ)	(not in situ – gold cup, amber pendant with gold trim)	-	Needham 2006

Site (Number on Fig 9)	Region (NGR)	Material	Condition	C14 dates	Feature /site	Associated vessels	Other associated artefacts	MNI, age, sex, cremation/ inhumation	Site report/ osteological data
River Thames (16)	Thames	Bronze	Intact	-	river	-	-	-	Woodward et al. 2015
Shaw cairn (8)	Greater Manchester, SJ98678724	**Bone**	**Burnt, socket fractured**	-	Kerbed round cairn	?	?	?	http://www.mellorarchaeology.org.uk/shaw-cairn.html
Staarvey Farm (3)	Isle of Man, SC280843	**Bone (cattle or horse)**	**Burnt, socket fractured**	3515+45 BP [GrA-29940]; 1956–1696 cal BC	**Cist**	**Collared Urn, inverted (+2nd vessel)**	**Plano-convex flint knife, flint end scraper, bone beads, bone point, bone oblongs**	**4: 1 child, 1 adolesc., 2 adult (1 male), C**	**Woodcock 1999; this article**
Wilmslow (7)	Cheshire, SJ8480	**Bone**	?	-	?	**Collared Urn, inverted**	?	?, **C**	Evans 1881, 228
Winterbourne Stoke G4 (15)	Wiltshire, SU0741	Antler or cetacean bone	Mostly intact	-	Pit, barrow	-	'Elm chest with bronze straps', Camerton-Snowshill knife-dagger, bone 'tweezers', **bone pin**	?, **C**	Colt Hoare 1810
Winterbourne Stoke G9 (15)	Wiltshire, SU0741	Amber	Mostly intact	-	Pit, barrow	?	?	?, **C**	Colt Hoare 1810
Winterbourne Stoke G66 (15)	Wiltshire, SU0741	Cetacean bone; damage to basal slot	Basal slot reworked, otherwise mostly intact		Pit under barrow	**Collared Urn**, upright	bronze knife-dagger blade, 'black' beads	?, **C**	Colt Hoare 1810

NB: A further pommel was found at Ovenden, Halifax, with cremated human remains in an inverted Collared Urn in a cist (Longworth 1984: 279). The pommel has been lost. A pommel found at Narrowdale Hill, Alstonfield, Staffordshire, has a pronounced lipped socket, like class 3 pommels, but is less oval in shape: it was also found in cremated remains in a cist within an urn. The vessel is listed by Hardaker (1974, Appendix table) as a Cordoned Urn, but the basis for this is not clear and the urn is reported as lost by Barnatt & Collis (1996, 219). It is possible that the association of class 3 pommels with cremated remains, inverted urns (largely Collared Urns) and cists was better represented in the West Pennines than Table 1 illustrates.

References cited in Table 1 (expanded version)

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