

THE CONTENTS AND CONTEXT OF THE BOUGHTON MALHERBE LATE BRONZE AGE HOARD

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The Boughton Malherbe hoard of copper and copper alloy artefacts and fragments was found in arable land in 2011. It has been dated to c.850-750 BC in the Late Bronze Age. The hoard was buried in a pit in 344 pieces derived from no more than 340 objects, two of which were pushed inside other socketed objects prior to deposition. Previous references to 352 items relate to the condition of the objects as presented for the Treasure valuation committee rather than the real quantity of deposited remains. This paper sets out the full contents of the hoard, as deposited and their current state. Details are given of the condition and type of the contents and comparisons are drawn with other known contemporary objects. Initial results of investigation into the deposition and landscape context of the find add to the complex set of data for this impressive assemblage. The paper is intended as a preliminary study from which further research can develop.

The Boughton Malherbe hoard of Bronze Age copper and copper alloy objects was discovered crammed into a pit below the plough soil in August 2011 by metal detectorists Messrs Hales and Coomber in the parish of Boughton Malherbe (Figs 1 and 2). The discovery was reported to the Finds Liaison Officer for Kent, Jennifer Jackson, who led further archaeological investigation of the findspot. It was designated as treasure under the 1996 Treasure (Designation Order) 2002 (PAS ID: KENT-15A293). Initial cataloguing was carried out by staff and volunteers at the British Museum (Ben Roberts, Mafalda Raposo, Steven Matthews and Jessica Leedham (Matthews *et al.* 2011) to produce a report for the Treasure Valuation Committee. This catalogue contained every individual piece (pieces stuck together were reported as a single object) making a total of 352 items. The hoard was assigned to the Carp's Tongue complex of Late Bronze Age metalwork owing to the presence of sword fragments of this type and their combination with other specific object types and fragments. Dated to between c.850-750 BC on typological grounds (see below), this is the largest hoard of its type in Britain. It has been described as the third largest Bronze Age hoard but neither the largest nor the second largest are contemporary. The Isleham hoard from Cambridgeshire contained 6,500 items dating to c.1150-1000 BC and the Langton Matravers hoard in Dorset dated to c.800-600 BC contained 777 items recovered from four pits (Matthews *et al.* 2012; Roberts *et al.* 2015).



Fig. 1 Photograph of the hoard as received by the Portable Antiquities Scheme. PAS CC BY. From top to bottom: ingots and ingot fragments, sword pieces, spearheads and mould fragments, socketed axes and fragments, winged axes and fragments, miscellaneous tools, ornaments, fixtures and fittings.

The hoard was purchased by Maidstone Museum and Bentrif Art Gallery after financial support from the local community enabled the successful application for grants from The Art Fund, the MLA/V&A Purchase Grant Fund and the Headley



Fig. 2 Location of the Boughton Malherbe hoard, other local sites and hoards mentioned in the text. PAS hoard sites are marked by centre of parish only.

Trust. A further grant was obtained from the Kent Archaeological Society Allen Grove Local History Fund to enable the hoard to be catalogued for the museum archive, photographed, repackaged and researched in preparation for talks to the local community. The objects were accessioned with sequential numbers from MNEMG 2014.13.1 to MNEMG 2014.13.352 corresponding with the treasure report (*see the KAS website for the full list*). Where specific artefacts are referenced below the last part of the number is quoted in parentheses, for example MNEMG 2014.13.213 is (213). This work was carried out by the author with support from museum staff including Samantha Harris, Pernille Richards and Rebecca Arnott. The local interest in this hoard has been vital to its preservation and continued research. In return a number of the finds were made accessible to the public as part of talks held at Grafty Green Village Hall and Maidstone Museum. A selection of the finds is currently on display at Maidstone Museum (Adams 2014). Since its discovery the hoard has also received academic attention and is central to debates about the practice of hoarding during the final stages of the Bronze Age (e.g. Matthews 2013; Brandhem and Moskal-del Hoyo 2014).

This paper presents the initial results of further work carried out on the hoard as part of the process of cataloguing and preparing it for storage at Maidstone Museum. As a result it has been possible to revise the original catalogue in terms of the quantity and type of objects and assess the contents of the original deposit versus their condition as presented to the Portable Antiquities Scheme. It is anticipated that publishing the evidence at this stage will be a pertinent reminder of the need for continued support and funding to conserve this collection. Conservation work that would provide much needed careful cleaning to enable precise recording and assessment of the hoard and to provide remedial work to preserve and maintain the collection for the future.

The hoard contents

In its current condition the hoard is in 358 metal pieces including every small fragment, part of an object and complete objects (Table 1). It entered the ground as 344 pieces derived from no more than 340 copper and copper alloy objects (and potentially fewer). Preliminary results of X-ray fluorescence analysis, undertaken by Xose-Lois Armada and the author, show the alloys to be bronze with variable lead content. The full results of this analysis will be published in due course. In its current condition the total weight of the hoard is 64.2kg. This is slightly heavier than the weight of the metal owing to the presence of sediment still attached to and filling some of the objects. Once the objects are cleaned and conserved the total weight is still estimated to exceed 60kg. The lightest fragment weighs less than 0.1g (342: the smallest fragment from the long decorated plaque) but the lightest complete object is a copper alloy ring (269) weighing 11.1g. The heaviest object is a complete, plano-convex copper ingot (213) weighing 7.446kg. The objects and fragments range in size from a few millimetres to 238.5mm diameter (ingot 213). One object, a fragmented decorated plaque, was originally over 244mm long but was deposited in the ground folded in half so it occupied a space no longer than 142.43mm. The folding of the object caused it to weaken and snap so that it is now in four pieces (322, 323, 342 and 347).

The median object or fragment weight for the hoard assemblage is 54.2g; the median length 50.34; median width 34.18 and median thickness 13.57 (all averages

TABLE 1. THE BOUGHTON MALHERBE HOARD CONTENTS

Organised by object category, listing the number of fragments (pieces), maximum number of objects from which these pieces are derived and the total weight for each category. Percentages relate to percentage of the entire hoard/assemblage. For a breakdown of the type of objects in each category see Table 2.

Object Group	Current no. of pieces	% of hoard pieces	Max. no. of objects	% of hoard objects	Total weight (g)	% of hoard weight
Tools	151	42.18	147	43.24	17,006.60	26.48
Edged Weapons	78	21.79	75	22.06	3,268.20	5.09
Metalworking remains/equipment	67	18.72	67	19.71	43,128.63	67.15
Personal ornament, fixture and fittings	48	13.41	38	11.18	744.50	1.16
Vessels	1	0.28	1	0.29	25.30	0.04
Miscellaneous sheet fragments	13	3.63	12	3.53	51.30	0.08
Total	358		340		64,224.53	

are similar with the exception of the weight which is distorted by the heavy ingots giving an average weight of 181.94g). Given the weight and bulk of the hoard this is not a particularly portable collection without the aid of a wheeled vehicle or pack animal or several people to assist with transport or several return trips by a single person.

Table 1 and **Table 2** show that the different ways in which the contents are described can give a different emphasis to the hoard contents. For example, the hoard appears to be dominated by tools whether one is looking at the total quantity of fragments (42.18 per cent of the total hoard) or the total quantity of objects represented as complete or fragmentary items (43.24 per cent). This is followed at some distance by sword fragments and spearhead fragments (Edged Weapons: 21.79 per cent of pieces and 22.06 per cent of maximum number of objects). In contrast comparing the weight of the items in the hoard shows it to be distinctly dominated by metalworking remains and equipment: copper ingots, copper alloy casting waste and moulds (67.15 per cent of the total weight of the hoard). Ingots alone make up 64.49 per cent of the total weight of the entire hoard owing in part to the size and density of the seven complete copper ingots but also to the large quantity of ingot fragments: 47 pieces. It has not yet been possible to assess whether any of these fragments derive from the same ingot but this may be addressed in future research into the source of the ingots (by Xose-Lois Armada and Sophia Adams). Furthermore, the way in which the material is grouped affects the overall concept of the hoard's contents. For example, a far greater variety of items have been classified as objects of personal ornament and fixtures and fittings than as edged weapons. We must remain cautious as to whether a Bronze Age person would have grouped their artefacts in the same way. For example, in the Bronze Age objects might have been grouped together based on who used them or the way in which they were worn or carried rather than whether they were a tool or a weapon. Swords dominate the assemblage in terms of objects that are only included in fragments. Complete objects are dominated by axes. Patterns or lack of patterns in the pieces in the hoard will be discussed further below. What is clear at this point is that there is no simple pattern to the composition of this or other comparative hoards. This has led to debate about the reason for each collection and episode of deposition in the ground.

Hoard Type

The hoard has been identified as belonging to the Carp's Tongue tradition (Matthews *et al.* 2011; Matthews *et al.* 2012; Matthews 2013) but it has also been proposed as the British type-site for a cross-Channel hoard tradition: the Boughton-Vénat hoards (Brandherm and Moskal-del Hoyo 2014). These equate to a period of metalwork deposition in the Late Bronze Age in north-western Europe from the ninth to eighth centuries BC when copper alloy objects, often in fragments, and copper ingots were buried in discrete groups that archaeologists describe as hoards. The Carp's Tongue hoards are named after this sword type. It is a distinctive slashing and thrusting weapon that was cast in bronze complete with hilt and grip (over which was attached a handle of organic material) and a straight blade that narrowed towards the tip to form a long point (the 'Carp's Tongue').

TABLE 2. THE BOUGHTON MALHERBE HOARD, CONTENTS AND FRAGMENTS
BY OBJECT TYPE

Complete objects include those where all parts of the object are present even if they are damaged. Not one complete object is in pristine, unused condition. Pieces references those individually catalogued fragments. Fragments marked with an * mean the list includes as a single entry any fragments that join together to make a single larger piece. The fragments column includes both large and small pieces.

Object Group	Object Type	Pieces	Total no. of objects	Whole	Whole but in pieces	Fragment only
<i>Total Assemblage</i>	<i>All Objects</i>	<i>358</i>	<i>340</i>	<i>59</i>	<i>4</i>	<i>279</i>
Tools	Axe	1	1	1	-	-
	Axe	111	108	25	1	82*
	Chisel	1	1	-	-	1
	Gouge	5	4	1	1	2
	Hammer	1	1	-	-	1
	Knife	30	30	3	-	27
	Socket unspec. type	1	1	-	-	1
	Blade unspec. type	1	1	-	-	1
Edged Weapons	Sword	50	50	-	-	50
	Spearhead	28	25	1	1	23
Metalworking remains/equipment	Ingots	54	54	7	-	47
	Axe moulds	4	3 or 4	1	-	3
	Casting Waste	9	9	9	-	-
Personal ornament, fixture and fittings	Armring	3	2	-	-	2
	Band	1	1	-	-	1
	Bracelet	13	12	-	-	12
	Bugle-shaped	2	2	2	-	-
	Button	1	1	1	-	-
	Hollow Cap	9	4	-	-	6*
	Hub Cap	1	1	1	-	-
	Loop	1	1	-	-	1
	Pendant	1	1	1	-	-
	Pin	1	1	1	-	-
	Decorated Plaque	5	2	1	1	-
	Ring	8	8	2	-	6
	Squared strap-fitting	1	1	1	-	-
	Stud	1	1	1	-	-
Vessels	Bucket frag.	1	1	-	-	1
Miscellaneous sheet fragments	Sheet metal	13	12	-	-	12*

Although many swords and sword pieces are identified as Carp's Tongue there is some disagreement amongst scholars over what are the defining characteristics of such swords. A number of sub-types of the form exist but the only consistent feature of classic Carp's Tongue swords is an even, unbroken curve from the grip into the shoulders (i.e. the part where the handle widens before it steps back in to the blade) (Brandherm and Burgess 2008, 135). This precise piece is absent from the entire Boughton Malherbe hoard, so too are any tip fragments although a couple of pieces are derived from the point at which the blade narrows (43 and 47). Most of the pieces in the hoard identified as Carp's Tongue are recognised by the presence of a 'narrow midrib defined on either side by grooves' (*Ibid.*).

The Carp's Tongue hoards are identified not only by the presence of the sword fragments but also the composition of the contents. These include items that are typical of the hoards and those that are often included in the hoards. The difficulty arises with defining the main object forms that occur in the hoards and commonly associated but not primary components. Steven Matthews proposed that the Boughton Malherbe hoard contains both objects primary to the Carp's tongue complex and those that are often found in the hoards but are not specific to the complex (Matthews 2013, 57-9). The primary objects include: a specific Carp's Tongue sword form, the Type Nantes; lozenge sectioned pommel pieces; bugle-shaped objects and hogs' backed knives (Table 2). The secondary and tertiary types include socketed axes, bracelets, decorated plaques and casting debris. In contradiction to this interpretation the hoard does not contain other items typically recovered in these hoards such as bag-shaped sword chapes and denticular plaques. Brandherm and Moskal-del Hoyo (2014) instead proposed that the Boughton Malherbe hoard would better be described as a Boughton-Vénat hoard referencing this and the hoard from Saint-Yrieix-sur-Charente, near Angoulême in France (Coffyn *et al.* 1981). These two sites represent either end of the geographical distribution of these hoards and both contain the 'widest range of elements characteristic of this group' (Brandherm and Moskal-del Hoyo 2014, 24). They propose that the Carp's Tongue hoard typology in use for decades is too restrictive in light of new finds and research. There is a compelling argument given the quantity of components in these hoards that appear to derive from both South-East England and Atlantic France and the recognised parallels in both the material culture and deposition behaviour of these two areas. Although there is discussion over what are the characteristic features of these types of hoards and to find a comfortable definition of the new type they needed to smooth the data in the way the objects were grouped (*Ibid.*, 31).

The Boughton-Vénat complex is dated to c.900/875-800/775 BC and possibly only a few decades pre and post 800 BC (*Ibid.*, 33) fitting comfortably with the anticipated date of the objects found here. The tool of typology in this instance is vital for obtaining some semblance of a deposition date given the absence of organic material that could be scientifically dated. The condition of the objects is the best estimate for the relative length of curation of any of the artefacts prior to deposition. In this instance the definition of the hoard type is of value for recognising connections and possible directions of influence and shared behaviour but defining the hoard as a specific type should not be the entire purpose of studying the material remains.

Composition of the hoard

As aforementioned the hoard contains a number of artefact groups as presented in Table 2. Within each group are variations in the form and therefore potential date and origins of different artefacts. There is not the space here to examine the typological data on all the objects in the assemblage but the following snapshot indicates the range and also the parameters in terms of date and distribution.

The hoard contains 108 axes which may be separated into three groups: 1) palstaves; 2) end-winged axes (**Fig. 3**); and 3) socketed axes (**Fig. 4**). The four palstave fragments are the earliest objects incorporated into the hoard potentially predating the other items by a century or more. Nine whole end-winged axes, albeit with some element of damage typically to the wings, and fragments of a further 42 different end-winged axes were found in this hoard. The end-winged axes are often considered to be a product of France although they are a common, if less abundant, component of contemporary hoards in Britain. The inclusion of end-winged axe moulds in this hoard begins to open the question of where these were made (see below). Certainly the quantity present here is worthy of further investigation. Similar numbers of socketed and end-winged axes were found in the hoard but it contains more complete examples of the socketed types: 17 whole axes, one of which was buried as two separate but refitting pieces, plus fragments of a further 35 socketed axes. The majority of the socketed axes have been identified as South-Eastern type including plain versions, several with raised, curved wing decoration (138, **Fig. 4**) and at least two with pellet and wing decoration (147). Two further different types have been identified so far: a faceted Meldreth type (146) and a South Wales/Stogursey type axe, broken down one face (155). The latter example differs slightly from a classic South Wales axe in that the side loop is attached below the socket collar rather than springing from the lip of the collar (Schmidt and Burgess 1981, 239). The full identification of the axe types present will only be possible when the hoard has been conserved. Several of these objects are still caked in the soil that filled the pit. At present it would appear that all the socketed axes are contemporary types supporting a deposition date around 800 BC.

Of the other tools only the gouges and knives include more than one example. The hammer (178) and chisel (293) are both socketed types but the adze (91) is of end-winged form. The four gouges are all socketed types with locally comparable examples in the Minnis Bay hoard, Thanet (O'Connor 1980, fig. 61). The knives may be split into four groups: 1) 11 hog's backed knives (of which only one is complete); 2) 11 tanged knives; 3) four socketed knives including the socket and blade fragment of a distinctive Thorndon Type knife (14); and 4) further unidentified blade fragments (**Fig. 5**). These are also among the expected types for the Ewart Park metal assemblage that is contemporary with the Carp's Tongue period but has a greater representation in England and likely origin in Northern Britain (Colquhoun and Burgess 1988).

Four main sword types are represented within the 50 fragments in the hoard: St Nazaire, Ewart Park, Carp's Tongue Type Nantes and Auvernier/Tachlovice (**Fig. 6**). Most common are the Carp's Tongue swords with 29 blade fragments and five grip and hilt fragments; where the specific subtype can be recognised these appear to be Type Nantes. These swords tend to be found in fragments



Fig. 3 Palstave fragments and end-winged axes from the Boughton Malherbe hoard.
(Photo by S. Adams ●Maidstone Museum.)
Top row: palstaves; middle and bottom row: end-winged axes.



Fig. 4 Socketed axes from the Boughton Malherbe hoard.
(Photo by S. Adams ●Maidstone Museum.)



Fig. 5 Knives and tools from the Boughton Malherbe hoard.

(Photo by S. Adams ●Maidstone Museum.)

Top row: socketed and tanged knives; middle row: hogs back knives and chisel;
bottom row: adze, gouge (in two pieces) and hammer.

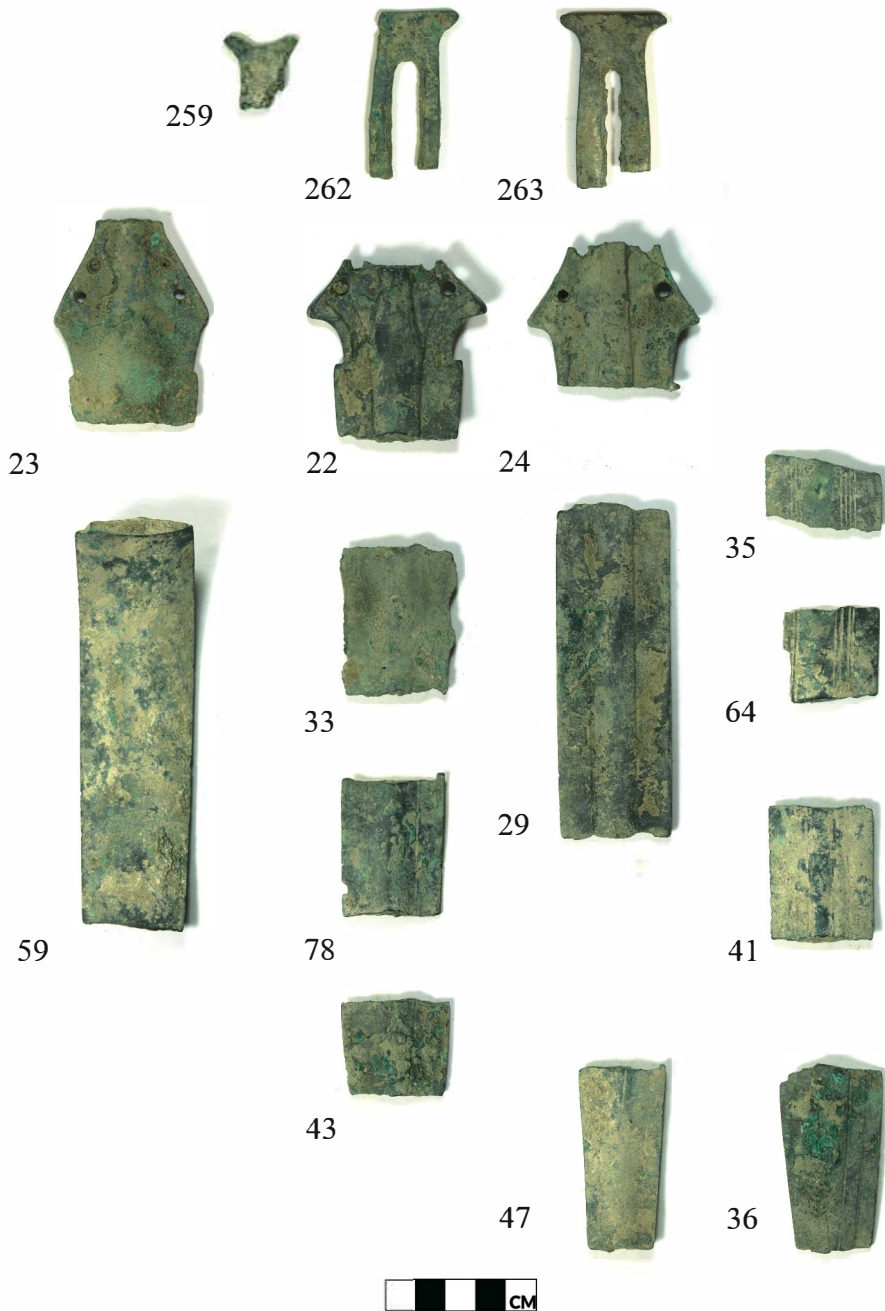


Fig. 6 Sword fragments from the Boughton Malherbe hoard.

(Photo by S. Adams ●Maidstone Museum.)

Sword types: Ewart Park: 23, 59; St Nazaire: 35, 64; Carp's Tongue: 24, 29, 33, 43, 47, 78, 259, 262, 263 (Nantes: 22); Auvernier/Tachlovice: 36, 41.

in dryland hoards and only occur in a complete condition as single finds or in burials (Brandherm and Moskal-del Hoyo 2014, 14). The other types are less well represented: five blade fragments from Ewart Park swords and one hilt fragment, potentially four Auvernier/Tachlovice type sword blades with a series of bevelled ledges as decoration and four further blade fragments each with four parallel but not equidistant grooves flanking either side of the midrib, identified as St Nazaire Type (Matthews *et al.* 2011). The St Nazaire type precede the Carp's Tongue form thereby representing the earliest sword fragments in the hoard. There is not the space here to examine in detail the typology and chronology of the Late Bronze Age swords; these issues are examined with far greater finesse by other scholars (Colquhoun and Burgess 1988, 53-4; Brandheim and Burgess 2008; Burgess 2012, 141-142; Brandherm and Moskal-del Hoyo 2014, 2-24). The Auvernier/Tachlovice swords are the most decorated forms in the hoard and are more typically found in eastern and central Europe; they are rare but not unknown in France and southern England (Boulud Gazo 2011, 144-150, fig. 18) and reflect the long range of contact represented within the contents of the Boughton Malherbe hoard.

The hoard contains fragments of 25 socketed spearheads, from small socket pieces and blades to two almost complete spearheads (2 and 4) (Fig. 7). These include a large fragment from the blade of a Davis Group 11, Generic Type IIA flame-shaped spearhead (1) and an almost complete Group 11 Generic Type IIB with a Wide blade base (2) (Davis 2015, no. 492 Pl. 54 and no.583 Pl. 63). The Group 11 Generic spearheads form 72 per cent of the known corpus of Late Bronze Age spearheads in Britain. It is of note that Late Bronze Age spearheads are a far more common weapon find than contemporary swords (Davis 2015) yet in this hoard it is the sword pieces that outnumber the spears.

Amongst the group of ornaments, fixtures and fittings there are some variations, particularly in the bracelets, although not one is a complete object (Fig. 8). These include a hollow armring (now in two pieces: 295.1 and 296), ribbed penannular bracelets (272 and 277) and plain banded bracelets with flat or everted terminals (270 and 274). There are plain banded bracelet fragments with hoops for terminals (282, 283 and 284) similar to those found in the Grays Thurrock I and Saltwood, Folkestone, hoard and Juvincourt-et-Damary in France north of Reims (Jockenhövel and Smolla 1975, 294, fig. 4; O'Connor 1980, fig. 56). Plus an everted terminal and decorated band of a large bracelet (316) comparable to the 'Grande Palette' bracelet from Aresle-Longue à l'Epine, Hautes Alpes, France (Butler and Steegstra 2008, 380, fig. 3b, Appendix A). Except the French example has a hollow back whereas the Bought Malherbe example appears to have an enclosed hollow core and may have been formed by lost-wax casting. Similar incised decoration is also found on other hollow cast bracelets of this type from Belgium, Germany and Switzerland thought to be created by the lost wax method. The Juvincourt hoard also contains a plaque fragment decorated on one side with concentric circles in low relief (Jockenhövel and Smolla 1975, 295, fig. 5), comparable but not identical to the loop backed single decorated plaque fragment (319) in this hoard (Fig. 9). Potentially such objects could have been created locally owing to the presence of a small fragment of a clay mould recovered from the boundary ditch of a Late Bronze Age ringwork at Mill Hill, Deal in 1934, now held at the British Museum (BM: 1939, 1003.61; Stebbing 1934; Champion 1980). The mould has previously



Fig. 7 Spearheads from the Boughton Malherbe hoard.
(Photo by S. Adams ●Maidstone Museum.)



Fig. 8 Ornaments, fixtures and fittings from the Boughton Malherbe hoard.
(Photo by S. Adams ●Maidstone Museum.)



Fig. 9 Plaques from the Boughton Malherbe hoard.
(Photo by S. Adams ●Maidstone Museum.)

been described as for casting rings but recent study by the author has shown it to be suited to casting plate-like items decorated with low relief concentric circle patterns. The sequence of raised and indented circles does not correspond exactly with those on the Boughton Malherbe plaque (319) but the style is similar. New comparisons to the hoard contents are constantly coming to light both through archaeological excavation, metal detecting activity and revisions to museum catalogues. One such object is the Fransham gold pendant found in 2012 in Norfolk

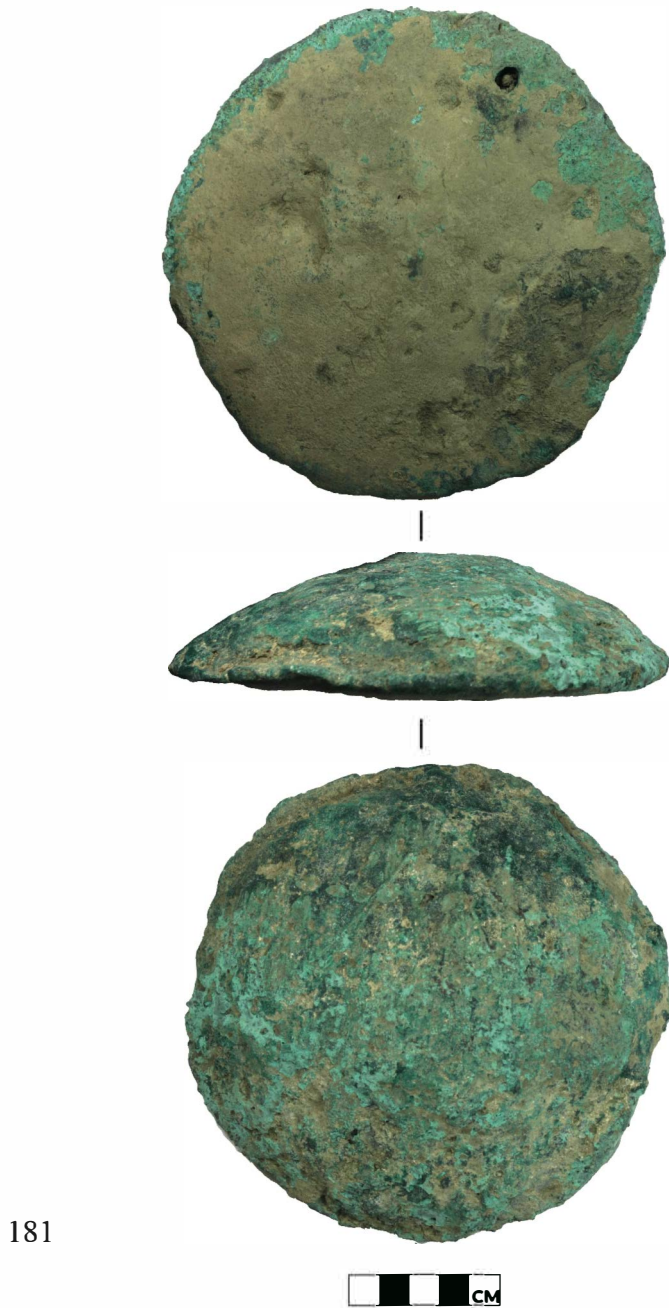
(PAS ID: NMS-65A2F7); despite the different metal the form is exceptionally similar to, albeit shorter than, the copper alloy pendant (285) from this hoard. The hoard also includes more rare items like the fragment of a bucket rim and shoulder (264) and an unusual squared hollow object, probably a form of strap fitting or connector (320).

The less glamorous material, the lumpen ingots and the casting debris are often only discussed in terms of their presence. As aforementioned these objects make up over 67 per cent of the total weight of the hoard. The Boughton Malherbe hoard contains seven complete ingots ranging in size from 154.5 mm diameter to 238.5 mm and 2.297 kg to 7.446 kg, plus a further 47 fragments (**Fig. 10**). Samples have been taken from three of the complete ingots (213, 215 and 217) and four of the fragments (219, 221, 227 and 228) for Lead Isotope Analysis as part of ongoing research into the origins of the copper. The results will be published in due course. Given the location of this find in Kent we can at least be certain that the copper source was not local to the findspot but whether the metal was transported across the channel or around the coast of Britain or from further afield we do not as yet know.

The hoard contains nine pieces of copper alloy casting waste: four casting jets (these are formed in the gate through which the bronze was poured into the mould and were separated from the object after casting), three puddles of bronze, a waste fragment of bronze and a further piece of casting debris or miscast object (330) (**Fig. 11**). Two cone-shaped, single-runner casting jets (313 and 314) are of a form that might be produced when casting an end-winged axe. Another has two runners or feeds into the mould (315) and the final sprue (331) is of elongated form with four separate thin runners, perhaps for casting multiple objects or ensuring the flow of bronze into a narrow mould for a thin object. Certainly the number and position of the runners does not correspond with those produced from casting socketed axes with a clay core, despite the visible remnants of the runners on the mouths of some of the axes (e.g. 155). In other words the debris is only related to a small selection of the products within the hoard. It is not yet known whether this is typical or accidental but it may be possible to explore these associations in comparative hoards.

Metalworking activity is also represented in the presence of miscast objects indicating failures in the casting process, and objects that have not been finished, such as a spearhead fragment with the casting flashes still present around the edge of the blade (72). One item grouped with the personal ornaments is also a miscast band (279), the 'hub cap' object (242) is a failed casting with a large hole where the metal has not fully filled the mould (**Fig. 8**). Other items in the hoard have casting flaws, some of which do not appear to have been a hindrance to their use, including small holes on the side of axes. Other casting flaws appear to have caused the object to break or fail during use such as the off-centre positioning of the core in the South Wales axe (155) which created one thinner face that broke away from the axe before it entered the hoard (**Fig. 4**). Spearhead (9) has an off-centre socket with a break in the cast surface on the thinner side. This could be later damage but it is also possibly a casting flaw.

The collection of metalworking materials in this hoard is exceptional owing to the presence of four pieces of bronze moulds for casting bronze end-winged



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Fig. 10 Ingot example from the Boughton Malherbe hoard.
(Photo by S. Adams ●Maidstone Museum.)



Fig. 11 Casting gates/sprues from the Boughton Malherbe hoard.
(Photo by S. Adams ●Maidstone Museum.)

axes (218, 246, 247 and 260) (Fig. 12). Bronze bivalve moulds for casting bronze objects were in use during the Middle and Late Bronze Age in Britain and Europe but are relatively rare finds. Only 52 other examples are known from England and Wales and one possible example from Ireland (Webley and Adams 2016). Most are designed for casting palstaves or socketed axes, the Boughton Malherbe finds are the only examples found in Britain for casting end-winged axes (*Ibid.*). Perhaps the closest comparison is the end-winged axe mould from Amiens from Reverend William Greenwell's collection which was donated to the British Museum in 1908 (BM: WG.2258.a-b).

None of the Boughton Malherbe moulds are complete: one consists of one complete valve (260) the others are all fragments none of which are the parts of the second valve for the complete example. Of the three remaining fragments two are from the blade end of different moulds (246 and 247) and one is from the mouth of a mould, the edge of the gate where the molten metal is poured in to cast the object (218). It is possible that the mouth piece (218) and blade fragment (247) derive from the same mould, owing to the form of the outside of the mould, but this cannot be confirmed. Typically, the bronze moulds are discovered as isolated finds or in hoards, never in settlement contexts. In this way the Boughton Malherbe examples fit with the general deposition pattern. Examples are known where the products of the mould, both used and unused, are deposited with the mould itself, for example the Isle of Harty Hoard from Kent now in the Ashmolean Museum (*Ibid.*, 13-14). Owing to the way in which an end-winged axe is manipulated after casting it is not possible to confirm whether any of the axes in the Boughton Malherbe hoard were the products of the moulds found therein but, given the dimensions of the mould,



Fig. 12 Moulds from the Boughton Malherbe hoard.
(Photo by S. Adams ●Maidstone Museum.)

one axe (100) is a possible candidate. Recording these objects by photogrammetry could enable a more accurate correlation between the possible products of this specific mould.

The complete valve (260) and two of the broken fragments (246 and 247) are also decorated on the exterior. On the single valve this consists of a single ridge that separates into three prongs towards the blade end, each prong ending in a raised dot creating the overall impression of a bird's foot. Another fragment from one side of the blade end of the valve has a longitudinal ridge that is segmented creating a cord-like texture; this ridge also ends in a raised dot. The final decorated piece is the full width of the blade end of the valve and has three prominent raised nodules, the central one larger than the others. All the fragments retain features for articulating the surfaces of the two valves by means either of a raised ridge to correspond with a groove on the opposite valve or a round tenon to correspond with a round mortise. It would still have been necessary to bind the two halves together to prevent them separating when the molten metal was poured into the matrix. Bindings may have been passed through the handle loop towards the top of the complete valve (260) but the textured decoration on this and the other examples could also have assisted in securing bindings around the lower part of the mould. Yet the designs go beyond this functional role and as seen on other decorated bronze moulds they show greater variety and creativity than the restricted decorative detail found on any axes. By decorating matching valves in a similar way the corresponding parts of the mould could be identified but by using a mark distinctive to a specific metalworker it would be possible to identify their own tools.

Could these moulds have been a moment for the smith to indulge their own imagination or was it important to keep different people's products separate, in which case this implies group activity or did the concept of marking the mould imbue some quality into the process of casting? The presence of undecorated moulds for the same products including the aforementioned Amiens mould and moulds for socketed axes (Webley and Adams 2016) indicates that decoration was not a prerequisite of the design. If the decoration added value to an object what does this mean for our interpretation of the gathered contents of the hoard? Furthermore, does the presence of end-winged axe moulds in a hoard in Kent imply they were brought over in pieces with the axes or were they imported to enable production of the axes locally or were the moulds themselves made and used locally?

Complete and broken objects

Table 2 shows that of the 340 objects represented in the hoard only 59 are in a complete or almost complete state. One spearhead (4) was also complete when deposited but is now in four pieces (two pieces recorded as item 4 and two further socket fragments 336 and 346). Two of the complete but broken objects were placed in the hoard in pieces: and an axe (140 and 145) and a gouge (245 and 258). The larger decorative plaque now in pieces (322, 323, 342 and 347) was bent prior to deposition which snapped it and further fragments came loose during excavation. Although both ends of the plaque – each forming a roughly semi-circular shape –

appear to have been broken suggesting the piece may originally have been much longer. The remainder of the hoard contents, 279 pieces, are fragments or parts of objects. They do not fit together although it is possible that some of the sword fragments could potentially be different parts of the same sword. That means that up to 278 metal objects were broken before they were put in the ground and the remaining parts of those objects were kept or recycled or deposited elsewhere. Some show evidence for having been bent and snapped: e.g. sword blade fragment (59). Others could have been broken during use, as proposed for the South Wales axe (155). Further objects appear to have been partially crushed perhaps through striking with a hard instrument, such as the crushed and pierced spearhead socket (5). Some of the axes are broken across the thinner socketed part at the top of the blade (174) but others are broken into a solid cuboid piece across the body (95). None appear to have been melted but it may have been necessary to heat the metal in order to bend, snap or cut it, as indicated by research into the breakage patterns found in Bronze Age bronze objects (Turner 2010; Knight 2016). This implies that the manner in which these metal objects were broken required the involvement of a person or persons who knew how to manipulate the metal. If one perceives these hoards as accumulations of scrap material for recycling it would be necessary for these pieces to be melted down. Although we have limited data for the capacity of Bronze Age crucibles surviving examples show a considerable range in size from less than 100mm to over 200mm in diameter (Tylecote 1986, 96, figs 23, 24 and 25). Potentially the majority of the fragments in the hoard could have been melted in such crucibles but some of the pieces in the hoard are of an unwieldy dimension for melting. The copper ingots have an un-homogenous structure with air-pockets that would have made it easier to fracture these into smaller pieces to melt but the larger object fragments were not so easily manipulated.

Context

The hoard was found buried in a single pit *c.* 0.80m in diameter with the complete ingots at the top providing a capping to the contents (Matthews *et al.* 2012). Below these were axes with the folded decorative plaque (pieces 322, 323, 342 and 347) pressed against one side towards the base of the pit and the sword fragments and complete mould valve (260) at the bottom. Although no formal records exist of the order in which the items were deposited and extracted from the ground, photographs from the finders clearly show the upper layering of the ingots and axes. The lower sequence is known only from discussion with the finders although the location of the plaque is certain owing to the preservation of one piece (342) in situ against the edge of the pit. This piece was discovered during the controlled archaeological excavation that followed the reporting of the find. Smaller objects were found pushed into the socket cavities of at least two of the axes (176 and 177). Patches of corrosion indicate the close packaging of the pit contents, further highlighted by the small dimensions of the pit as recorded by the Finds Liaison Officer. This is not an isolated example of this deposition structure: the Carp's Tongue hoard from Wakering, Essex, was also found in a pit with the ingots at the top over axes (Crowe 2003). Often hoards come to light following their partial dissemination across a field by plough activity (for example the Hollingbourne Hoard PAS ID:

KENT-757FC0). Where they are recovered in situ it is vital to make every effort to record the position of the remains to help us understand the pattern of the deposit and use this to improve our understanding of the fascinating practice of putting so much metal into the ground.

No other archaeological features were discovered during the excavation of the hoard. Geophysical survey of the area was inconclusive. There is no LIDAR data for the site and aerial photographs have yielded little information. Further geophysical survey work to put the hoard in context would be beneficial. The site was located in arable land that takes advantage of the fertile soils over the Lower Greensand geology, a band spanning the inner rim of the Weald that was exploited in the Bronze Age (D. Yates *pers. comm.*). Other metalwork finds in the vicinity in particular around Lenham and Hollingbourne, combined with evidence for Bronze Age field systems along the course of the High Speed 1 rail route indicate the intensity of contemporary activity in the area (Yates 2007) (Fig. 2). David Yates and Richard Bradley have shown a correlation between the deposition of Late Bronze Age hoards and water sources (Yates and Bradley 2010). Coastal and riverine locations also dominate the distribution of known contemporary settlements and field systems in the South-East, especially when allowance is made for the location of the Bronze Age shoreline (Yates 2007). Although this find is not immediately located next to a water course, its location is at a watershed between the Great Stour flowing to the east and the tributaries of the Medway flowing west. These waterways would have enabled access to the Continent with its mineral sources and cultural affinities (Burgess 1968), and the highly significant Thames notable for the quantity of Bronze Age (and later) metalwork recovered from the river itself (Yates and Bradley 2010).

Discoveries of Bronze Age boats suited to coastal and sea-crossing journeys as well as vessels for travel along rivers and small creeks attest to the diversity of water travel around this time (e.g. Wright 1990; McGrail 2001; Clark 2004). While the draught of vessels such as the Dover boat highlight their suitability to bulk transport (Roberts 2004). This is not to assume all travel was by water. Finds of Bronze Age wheels at Flag Fen and Must Farm, Cambridgeshire, also indicate the use of wheeled land transport even in fen edge locations (Taylor 2001; Cambridge Archaeological Unit 2016). The Boughton Malherbe hoard was, therefore, sited at an advantageous position for the import and export of the objects it contained by sea, river and overland. The artefacts therein were not reused, recycled or recirculated they were intentionally buried at this location where they remained for almost 3,000 years before discovery.

The hoard only contains metallic items, no wooden spears or axe shafts (although possible remnants of the tips of these may be retained deep within the sockets of a couple of objects), no clay moulds or crucibles, no bone or textiles. It contains the materials for making metal objects, the waste produced from this process and the finished (and in many cases used) metal objects. What it does not contain are any of the ceramic materials used in the process, no crucibles for melting the copper and tin, no clay moulds, no fragments of clay tuyères (blow-pipes), nor any bone modelling tools. There is local evidence for clay moulds for casting a variety of objects including Wilburton swords at Holborough Quarry (Boden 2005; P. Clark *pers. comm.*), pins at Highstead, Chislet (Bennet *et al.* 2007), spearheads

and possibly swords at Yalding (D. Swift *pers. comm.*), and a decorated flat object at Mill Hill, Deal (Champion 1980, 237, figs 5, 6). Following the casting of copper alloy objects there was a deliberate segregation of the metallic materials and by-products from the ceramic and organic elements. This is typical of the period where not only do we find these metallic production materials in hoards usually located away from settlements (Turner 2010, 93) but we also find separate deposits of the ceramic refractory materials: crucible fragments and moulds in locations closer to or within settlements (Webley and Adams 2016, 332).

DISCUSSION

This hoard raises a number of questions about both the collection and deposition of Late Bronze Age metalwork. First and foremost is the sheer size of the hoard both in terms of weight and quantity of items. Second is the location of the find. Third is the range of items in the pit, and fourth the condition of the items when deposited. This is not a single sack load or armful scooped up and buried out of sight. Nor was it ever returned to and delved into for material to recycle. This is an assemblage of imported copper ingots, metallic materials and by-products from the production process, finished and used objects and miscast objects that were never used.

Many of the objects within the hoard have been transformed at some point prior to deposition. Swords have been transformed into fragments, decorative plaques have been bent in two and axe sockets have been stuffed with smaller objects. The hoard also contains the materials and tools used for transforming ore into metal objects that could cut, flatten, adorn, destroy and create. Pieces that could have been recycled have not been. Parts of hundreds of objects are present but we do not know what became of the remainder of those items. These hoards have been described as scrap but to use that term implies the objects are no longer of use in their present form. Yet ideas about the economic and social significance of hoards (e.g. Bradley 2013; Brandherm and Moskal-del Hoyo 2014) indicate their value extended beyond the utilitarian process of using an axe to chop wood or a sword to maim and kill. What at first may appear to be a random assemblage of bits and pieces, on closer inspection is revealed to contain contrasting patterns. Consideration should be given to the possibility that no single motive led to the burial of all hoards or the selection of all the objects they contain.

The copper and tin may be derived from sources in Britain or the Continent (Rohl and Needham 1998, 177-180). Results of the lead isotope analysis described above should contribute to this debate. Defining the location of the manufacture of the objects is an even more complex issue. The evidence of Boughton-Vénat hoards as a whole and the composition of this specific hoard evoke a sense of a world on the move, whether it was through a series of networks with people moving within their local sphere or single journeys over great distances is not as yet known. It is perhaps too simple an interpretation to look for the place in which certain objects were made and compare this to the place in which they were deposited in the ground.

This hoard has previously been described as the first scrap metal hoard imported from France (Matthews 2013, 59-60). Matthews proposed that the entire assemblage reached its place of burial as a single collection of scrap from France even though

some of the items in the hoard have been moved about and perhaps returned to their country of origin (*Ibid.*). This interpretation oversimplifies the evidence while at the same time implying that the contents had a complex history. Certainly this is a complex assemblage, like so many other Boughton-Vénat hoards the variety of possible sources for the objects therein is diverse and even more so given the size of this specific assemblage. The objects can be compared with local examples in Kent and the South-East and artefacts found elsewhere in Britain, France and beyond into Atlantic and central Europe. Some of the objects, such as the bracelets, could have been manufactured on the Continent given the stylistic affinities with artefacts found there. Others could have been manufactured in Britain given the typological affinities with other finds in Britain such as the South-Eastern axes. Others could have been manufactured locally given the presence of end-winged axe moulds in this hoard plus moulds for other comparable objects such as the possible plaque mould from Mill Hill or the gouge mould in the Isle of Harty hoard. Even if it could be ascertained where the artefacts were made this does not necessarily equate with where they were used or where they were broken into pieces. This may be compared to the case of the South Wales/Stogursey Type axes. Their distribution is concentrated in south-east Wales and the moulds for casting them were made with stone derived from southern Wales or the South-Western peninsula. Yet the moulds are also found widely distributed from Dorset to Surrey and the axes they produced are found elsewhere in England and on the Continent (Needham 1981).

Research on the metallic composition of this and other contemporary European hoards may bring us closer to identifying the source of the copper in this hoard and possible groups of production. Careful conservation of the artefacts would also enable more detailed comparisons of decorative features. This could narrow down the typological comparisons and therefore the possible source of the style of object or the design. Yet there is still a gap between the processes of deposition and the location of manufacture and use. The hoard represents not just a collection of artefacts but also the physical and social processes of gathering the material, breaking the objects, selecting the items to go in the ground and the order in which they were placed in the ground. It may have been a solitary endeavour but the accumulated evidence is hinting towards a communal effort. This paper is a starting block, from here we may incorporate this hoard into wider studies on manufacture, object use, manipulation, destruction and deposition to gain as close a picture as possible of the activities and thought processes that led to a single group of over 60kg of copper and copper alloy objects entering the archaeological record.

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