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Medieval Domed Chests in Kent: A Contribution to a National and International Study

CHRISTOPHER PICKVANCE

The aim of this article is to contribute to knowledge of a distinctive type of medieval chest. The focus will be on the origins of the chests, their timber, ironwork and internal design, and their period of production. The article contains a close study of the fifteen domed chests so far located in Kent, an identification of their lid timber, and a dendro-chronological study of one of the chests. Some new means of identifying the origins of the chests are suggested and comparisons made with some domed chests on the Continent. The focus on Kent is for reasons of easy access for the author, not because it is thought that the Kent domed chests are distinctive. It is hoped that future studies in the UK and abroad will allow some of the interpretations put forward to be tested.

PREVIOUS WRITING ON DOMED CHESTS

In medieval times in England, before the development of the framed, panelled chest around 1500, chests were of three types: dug-out, clamp-fronted (with wide stiles holding one or more boards between them) or boarded (with the boards held by pegs, nails and iron straps).¹ A perusal of illustrated sources makes clear that iron bands or straps were a very common feature of chests in this period, especially on boarded chests.² The straps held the elements of the chest together securely and protected it against forcible entry. Indeed, Geddes's study of medieval decorative ironwork contains more photographs of early chests than most books on furniture.³

The type of chest in question here, which following Eames will be called a 'domed chest',⁴ is a sub-type of the boarded chest with three features: a) the box is made of pine boards; b) the lid is hollowed out from a trunk also made of a light wood; c) the chest is held together and given extra protection by one or more iron bands or armouring (Figure 1).

This type of chest has been studied since at least 1902 when Roe noted two such chests (in the Pyx Chapel in Westminster Abbey and at Minster, Kent) in his seminal book on early chests and cupboards.⁵ The Minster chest he described as of elm (box) and oak (lid). Lewer and Wall illustrated nine domed chests in their book on 'church chests' in Essex (at Brightlingsea, Clavering, Colchester, Great Leighs, Great Tey, Little Bentley, Pentlow, Stebbing, and Ugley) plus three with planked lids which may or may not be replacements (at Great Wakering (oak), High Laver (elm) and Ingatestone

¹ Eames (1977), pp. 160–62; Chinnery (1979), pp. 69–73, 104–19.

² Lewer and Wall (1913); Sherlock (2008).

³ Geddes (1999).

⁴ Eames (1977), p. 109.

⁵ Roe (1902).



1 Ash armoured chest (Type A). *The author*

(yew)).⁶ These were a small proportion of the 155 church chests illustrated in the book. *The Dictionary of English Furniture* omitted any reference to domed chests in its chapter on chests but Cescinsky and Gribble described the domed chests at Groton and Chelsworth in Suffolk as of poplar and dated them to the late fourteenth century.⁷ Roe used the term ‘barrel-lidded’ in discussing the Harbledown and Minster (Kent) and Framlingham (Suffolk) chests.⁸ In his survey of the Home Counties, Roe noted that ‘round-topped’ chests were ‘not very scarce’ and described those in the Pyx Chapel, Baldock, Cheshunt and Kings Langley (Hertfordshire), and Little Bentley and Hadleigh (Suffolk).⁹ In other works he described domed chests in Ingatestone (Essex), Debenham and Framlingham (Suffolk), and St Swithin’s (Worcester), and says that ‘there are plenty remaining’ and that ‘the probability is that the greater number of them belong to a period not earlier than the sixteenth century’.¹⁰ The individual dates he gives them are mostly in the range 1500–1550.

After a fifty year gap, domed chests were again studied by Jennings, who identified the lid of the chest in the Pyx Chapel as willow,¹¹ and by Eames in her major survey of medieval furniture. Eames treats domed chests as one of two types of ‘standard’, the

⁶ It is misleading to describe all chests found in churches as ‘church chests’ as though they represented a type of chest. The term refers to the current location of chests, many of which have found their way there for safekeeping, or as a result of gifts or bequests [Edwards (1954), Vol. II, p. 3; Sherlock, 2008, p. 5]. Where churches were ordered to have chests these were specified by their purpose (e.g., to collect money for crusades or to keep alms) or by a requirement to have three locks but not by their shape or form [Lewer and Wall (1913), pp. 39–72; Sherlock (2008), pp. 3–5]. As Currie shows for Charing, Kent, the two chests made for the church in 1594 and 1635 have in common only their three locks but the former is a plain, boarded chest with iron straps, while the latter is a standard framed and panelled, carved chest [Currie (2007)]. The term ‘church chest’ does not refer to a specific type of chest and hence has no analytical value.

⁷ Edwards (1954), Vol. II, pp. 10–14; Cescinsky and Gribble (1922), Vol. II, p. 5.

⁸ Roe (1918).

⁹ Roe (1929), p. 19.

¹⁰ Roe (1905, 1920); Roe (1905), p. 131.

¹¹ Jennings (1974).

other having a gabled lid and being covered with leather as well as iron straps. She regards standards as chests 'associated with the transport of large quantities of goods' and notes that their lid shape would have thrown off water and discouraged their use as seats.¹² Eames made a detailed analysis of two domed chests (in Hereford Cathedral and a wheeled example in the Gruuthuse Museum, Bruges) which she dates to c. 1440 and 1450–1500 and identifies as of poplar, repeating Cescinsky and Gribble's earlier identification.¹³ She also notes the related wheeled chests in St John's and Sidney Sussex Colleges, Cambridge (the latter known to have been brought from Netherlands in the early seventeenth century), Little Waldingham (Suffolk), the Busleyden Museum, Malines, St John's Hospital, Bruges and two others in the Gruuthuse Museum and argues that, as a group, domed chests are of Flemish origin.¹⁴ Chinnery includes a picture of a domed chest, said to be of oak and elm, which he identifies as English and dates to 1500.¹⁵

More recently, von Stülpnagel has illustrated and described in detail a domed chest from Gollern in North Germany said to have a birch lid and a chest from Skrukeby, Sweden, in the Nordiska Museum, Stockholm which he says is of pine and birch.¹⁶ He also mentions four further domed chests, in Lubeck (two), Luneberg and Stralsund, but considers them possibly English or Scandinavian. He writes that 'it seems to be the case that, everywhere the Swedes were at the time of the Thirty Years War [1618–48], these chests can also be found. They are often to be encountered in Sweden, as well as in the German and now Polish North Sea region'.¹⁷ Albrecht also illustrates the Gollern chest and says that domed chests are mainly found in North Germany, Denmark and Southern Sweden.¹⁸

Gavin Simpson was the first person to attempt an inventory of domed chests in England and in 2008 identified 94 (and a further eight lost chests) based on existing records and visits.¹⁹ He noted that they were concentrated in the eastern counties, with 31 in Suffolk, 13 in Norfolk, 12 in Cambridgeshire (including seven at Cambridge University) and 8 in Essex. He describes a chest in St Margaret's, King's Lynn in detail and another in St Leonard's church, Zoutleeuw, Belgium, with a merchant's mark, and notes a chest at Diddington (Cambridgeshire) with a lid said to be of willow. Simpson suggests the name standard may have derived from the practice of storing a type of armour, also known as 'standard', in such chests. Also in 2008, Sherlock published *Suffolk Church Chests*.²⁰ This thorough study is based on visiting all the Suffolk churches and checking whether the chests listed in a late 1920s survey were still there; all but 20 out of 293 were. Sherlock gives nutshell accounts of the 28 extant domed pine chests (and four lost chests) with many photos. Of the 28, three had pine lids

¹² Eames (1977), pp. 112 and 172.

¹³ The Gruuthuse chest (Inv. no. 103333) is locked and completely iron-clad so Eames could not see the wood, a fact she acknowledges [Eames (1977), p. 175].

¹⁴ Eames (1977), pp. 172–77.

¹⁵ Chinnery (1979), p. 353. Its locks are atypical as well as its timber.

¹⁶ Von Stülpnagel (2000), p. 40.

¹⁷ Personal communication, January 2012.

¹⁸ Albrecht (1997), p. 36. However, Poul Grinder-Hansen has informed me that there are no domed chests in Danish collections.

¹⁹ Simpson (2008).

²⁰ Sherlock (2008).

(Westhope, Beccles and Gorleston) with the latter two being shallow domed lids.²¹ The total of 28 includes two chests with later flat lids (Blaxhall and Boxford) and one with a later domed lid (Finningham). Sherlock also commissioned dendrochronological studies of the two domed chests at Mendlesham, the first to be undertaken. These revealed that the pine was Polish, most likely from a location 70 miles south of Gdansk (formerly Danzig), and that the chests were constructed after the probable felling date of 1425.²²

Subsequent research by Simpson and others has raised the total of extant domed chests in the England from 94 to 130 (see Appendix 4). The total in Kent has increased from the six listed by Simpson to the 15 studied here. A useful source has proved to be www.flickr.com, a photo-sharing website. Since Suffolk and Essex are the only counties to have been surveyed thoroughly one can anticipate a further increase in the national total. Figure 2 shows the geographical distribution of the 138 extant and lost chests. The map shows a clear south-eastern bias, with small but significant clusters associated with the river systems of the Humber estuary and the River Severn.

Mercer has argued that chests with handles or rings were not necessarily used for travelling (as opposed to being pulled round rooms) since their laden weight would have been considerable. He writes that it is ‘highly probable that very few of those chests which have survived were meant to be portable’, and suggests that chests used for travelling were more likely to have been destroyed, be undecorated and hence unattractive, and to be too small for domestic storage.²³ Domed chests are probably rare survivors among chests used for travelling and may have survived because they subsequently became valued as compact, multi-purpose forms of storage. For example, their size, often around 140 × 60 × 50 cm, is significantly less than that of the flat-topped iron-bound boarded chests of 2 m or more which can be found in churches. As well as their possible origin for the storage of armour, their uses include the storage of all forms of valuables: documents, books, church vestments and cloth, plate, and money.

A number of issues emerge from this survey. Most important, the chests are geographically spread across several countries in North West Europe, though by far the biggest concentration is in England and especially in the east coast counties. This raises the central question of whether the chests were imported to England. Second, there is some variation in the timber and the construction. A few domed chests do not have boxes made of pine; some have shallow domed lids and the identification of the wood of the lid is also variable, with poplar, willow, birch and pine all being mentioned. The first three are pale and lack a distinctive grain and are thus difficult to identify without a microscope.

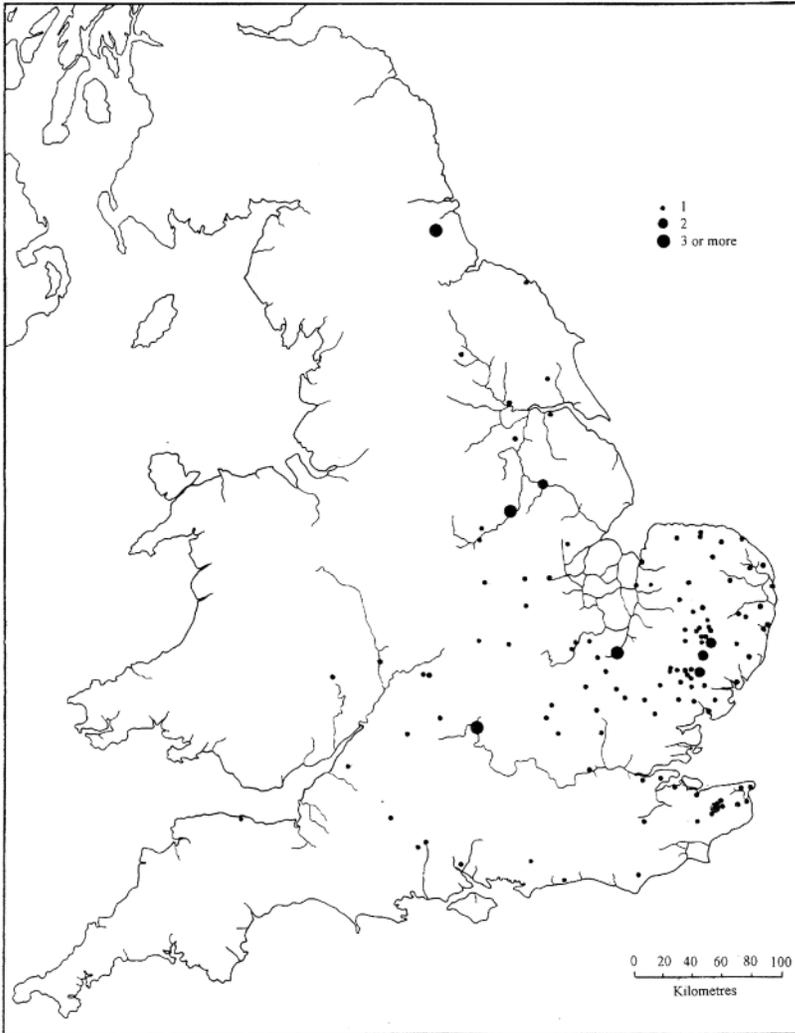
THE IMPORTED CHEST QUESTION

When similar objects are found in different countries, various explanations are possible involving one or more production centres, various patterns of subsequent movement, for example by trade, and differential rates of survival. When an object has been

²¹ The Gorleston chest is treated here as a Suffolk chest as it is included in Sherlock’s book; Gorleston is, however, in Norfolk.

²² Sherlock (2008), p. 30; Bridge and Miles (2011); Bridge (n.d.).

²³ Mercer (1969), p. 41.



2 The distribution of domed chests in England. Reproduced with the permission of Gavin Simpson. It is based on his 1998 map updated by the information in Appendix 4.

produced over perhaps two centuries the possible permutations become very complex. We examine in turn the simplest possibilities: a) that domed chests were or could have been made in England; b) that they were or could have been made elsewhere and exported to England, as finished or unfinished products. This examination is continued in the following sections on the Kent domed chests.

As shown above, various arguments about the importation of domed chests have been advanced. Eames advocated a Flemish connection, von Stülpnagel an English or Scandinavian connection, Albrecht a German or Scandinavian connection, and Simpson and Sherlock consider both a Flemish and a Baltic/Polish connection are possible.

It would be unwise to exclude from the outset the possibility of multiple places of production within a single region. The background is the rise in importation of timber. After a short period of German oak imports in the thirteenth century, there was a large rise in timber imports from the Baltic from the mid-thirteenth century onwards. This rise is attributed to the superior qualities of Baltic wood, increased demand, increasing ship size, and the rise of the organized Hansa trade with the Baltic facilitating imports of timber against exports of cloth.²⁴

Domed chests could only have been made in England if pine boards were available there. However, in medieval times, except in parts of Scotland, pine was not a native timber.²⁵ The fir, spruce, pine and deal referred to in historical records must therefore have been imported.²⁶ In fact, there is evidence of the use of Norwegian pine boards for wall panelling at Winchester Castle in 1252 and of imported fir from the thirteenth century for scaffolding, ladders, counters and partitions. Postan records the timber imports from Danzig as having been of pine, fir and yew.²⁷ Childs's analysis of Hull customs records gives evidence of the import of fir boards (and beams and rafters) in the fifteenth century.²⁸ Salzman does not give evidence of chests being made from pine in England but as his sources are building accounts one would not expect this. However, the two 2.5 m flat-topped iron-bound fifteenth-century softwood chests at All Souls College, Oxford seem to be an exception, since Eames considers that their size means they were made *in situ*.²⁹ The fact that domed chests are disproportionately found in the east coast counties is compatible both with their being made of imported timber and their being imported as chests. We can conclude that while there is evidence of imported pine and of its use in building, there is only evidence of its being used to make chests at All Souls College. Given that no systematic study of early chests has been made this cannot be regarded as a categorical denial that pine chests of some kind were made in England of imported timber.

Turning to the hypothesis that domed chests were imported, we examine evidence of the manufacture on the Continent of domed chests and of their arrival and presence in England, including import records, wills and inventories, and engravings and paintings. I had hoped that it would be possible to examine the composition of the iron used in the straps of the domed chests to identify its place of manufacture, as well as to possibly identify replacement ironwork. However, contact with a specialist in

²⁴ Bridge and Miles (2011); Childs (2002); Daly (2007); Malowist (1987); Postan (1987); Rackham (2006); Tyers (2004).

²⁵ Rackham (2006), pp. 28, 289–90.

²⁶ Chinnery (1979), pp. 164 and 355. The name deal seems to have originally referred to a type of board, e.g. 'iiij deales of fir' [Salzman (1966), p. 248], and later to have been used as a name for a type of wood.

²⁷ Chinnery (1979), p. 164; Salzman (1966), p. 248; and Postan (1987), p. 174. Postan was probably unaware of the role of Baltic oak imports which were only revealed in buildings in Britain by dendrochronological studies in the mid-1980s [Bonde et al., (1997)].

²⁸ Childs (1986).

²⁹ Eames (1977), pp. 169–70.

historical metallurgy revealed this to be a false hope at present.³⁰ Stylistic similarities with Continental woodwork and ironwork are examined later.

There is ample evidence that large numbers of medieval chests were imported. However, there are problems in interpreting this evidence. The first concerns whether chests are being imported for use as chests or simply as containers, along with barrels, in which products were exported, rather like tea chests today. Tracy refers to 2268 ‘chests’ being imported in four ships in 1308 and 1309 and suggests that the term covered containers as well as chests.³¹ The Hull customs records for 1453–90 allow one to go a step beyond this. They record that 16 boats from ‘Danske’ (Danzig or Gdansk) brought chests (*cistas*) and coffers and that whereas the former’s contents were often described, coffers were always described without reference to their contents. This supports the idea that while chests were containers, coffers were being imported for sale as coffers. The Hull records also allow us to estimate the number of coffers imported from Danzig across all the east coast ports as being between 425 and 838 per year in the second half of the fifteenth century.³² However, frustratingly, the Hull records do not further describe the coffers so we cannot tell what proportion had domed lids or pine boxes.

This leads to the second problem, that when additional information is given it is insufficient to allow identification. Eames notes that ‘by far the greatest number of references to imported chests refer to those from Flanders’ and that the brevity of the references suggests that Flemish chests were ‘instantly recognizable’.³³ She identifies three possible types: light panelled chests, iron-bound chests (such as domed chests), and tracery-carved clamp-fronted chests of the Brancepeth type. Of these she thinks the last two are the most likely since the first started too late for some of the references (unless ‘Flemish’ covered very different types of chest at different times).³⁴ If Flemish chests refer to domed chests it is compatible with the idea of their Flemish origin but does not guarantee it. Imported goods were sometimes described according to the country from which they were exported which was not necessarily where they originated, e.g. the French use of ‘*bois d’Hollande*’ to refer to Baltic oak shipped from Holland.³⁵ There was an extensive trade between northern European ports, especially Bruges, as well as the possibility of overland and river transport so the term Flemish chest does not solve the problem of the origin(s) of the domed chest.

As far as images of chests are concerned, a domed chest is shown in a fifteenth-century English manuscript of an alchemist’s room.³⁶ A large number of ‘Illustrations

³⁰ ‘The iron was produced using a technology which led to the formation of very pure iron. There is often some carbon present (i.e., steel) and in many cases phosphorus, but neither of these elements is distinctive to English or continental metalwork. In addition, iron of this period was effectively a composite material which contained a proportion of slag. There is active research on both sides of the Channel into the potential to use the chemical composition of slag inclusions to possibly identify provenance, however, the research has not yet developed sufficiently to be applied in a case like yours’. [David Dungworth, English Heritage, personal communication, March 2012].

³¹ Tracy (2001), p. 15.

³² For this calculation and further information on coffer imports from Danzig through Hull, see Appendix 3.

³³ Eames (1977), p. 137.

³⁴ The references are also too early to refer to iron Nuremberg chests, as suggested by Sherlock [Sherlock (2008), p. 10].

³⁵ Lavalley (1990), p. 22.

³⁶ Sherlock (2008), p. 7.

and artwork with chests' is shown at www.larsdatter.com/chests. Of these, ten are paintings and illuminations with domed chests, many of which are in outdoor settings, supporting the idea of domed chests being used for transport. Of the ten, eight are from fifteenth-century manuscripts in the Bibliothèque Nationale de France. The other two are an undated German engraving of 'The [Outdoor] banquet' and a 1585 portrait by Nicholas Hilliard. Hence pictorial evidence of domed chests in England may be rare. Hopefully, research will uncover further British examples.

Another type of evidence comes from wills and inventories which record 'spruce' chests. For example, Sherlock cites three examples of 'spruce' chests in Suffolk in documents dated 1463, 1471 and 1489 as well as others from after 1500.³⁷ The significance of this term is that 'spruce was a corruption of *Pruce* or Prussia, the area in which Danzig is located' and is thus indicative of an imported chest.³⁸ Chinnery also suggests that 'Danske' chests must have been softwood since wainscot (oak) chests are often distinguished from Danske chests in records. However, his examples all come from after 1500.

Overall, therefore, there is documentary evidence for pre-1500 softwood chests in England but it is not extensive, and does not specify domed chests. This makes it all the more important to identify the dates of construction of domed chests, which, as shown above, were placed at points from late fourteenth to the sixteenth centuries by successive writers, until the first dendrochronological dating was done.

Finally, we need to consider the possibility that some domed chests were imported unfinished, that is, with their lids detached from the boxes, and the ironwork added later. This would result in differences in the ironwork depending on where it was added, if local variations existed. One argument for this is that with the domed lid attached chests would take up more space in the hold of a ship. Against this is the probability that the pegged joints on their own would have meant the boxes were vulnerable to damage unless protected.³⁹ What is not known is whether this method would have led to a net saving. Would the cost of adding ironwork in England outweigh the saving in transport costs? It will be argued below that there is one feature of the ironwork, a type of nail head, on some of the chests, which is foreign, suggesting that those chests at least were iron-bound when they arrived. Nevertheless, we cannot make categorical statements in the present state of knowledge. The study of inter-county variations in ironwork remains worthwhile, though some chests, such as the Faversham chest, have moved around, and the present article provides a large amount of data on the ironwork of the Kent chests.

DOMED CHESTS IN KENT: THEIR COMMON FEATURES AND VARIATIONS

Before addressing the questions of date, timber and origins, we first present a picture of the domed chests in Kent on which the analysis is based, starting with their shared features, and then describing their principal variations. This section is based on the full details of the 15 chests given in Appendix 2.

³⁷ Sherlock (2008), pp. 8–9.

³⁸ Chinnery (1979), p. 355.

³⁹ For the possibility of protection, see Appendix 3.



3 Pegged splayed rabbet joint, Fordwich chest. *The author*

The domed chest is made of a pine box and a lid made from a hollowed out section of trunk from a relatively soft, light and non-durable hardwood, a combination that has the advantage of lightness and lower cost relative to oak. The lid is highly prone to erosion. The walls are 3–4 cm thick. The sides of the box meet the front and back in a distinctive pegged splayed rebate joint (Figure 3). The top edges of the front and back are chamfered to fit the sloping inside of the lid. The bottom is probably rebated into the front and back (it is usually hard to see this joint) but appears butt-jointed at the sides where it is visible. In cross section, the lid is thickest at the apex (8–12 cm) and thins to the front and back. The inside of the lid is smoothly finished and has a splayed rebate of about 6 cm allowing a neat fit over the four walls; it projects at each end by about 2 cm. The close fit no doubt contributes to the frequently clean, fresh appearance of the pine inside. The lid has a number of iron bands and is hinged to the box. These bands are typically around 6 cm wide. Where the lid also has horizontal bands, the vertical bands are imposed upon them, not interlaced. The box ends have one or more vertical iron bands with one or two staples through which suspension rings or triangles were fixed to which ropes or iron rods were attached to allow the chest to be carried



4 Sidney Sussex College, Cambridge, wheeled, armoured chest (Type A).
The author

5 St John's College Cambridge, wheeled, armoured chest showing suspension bars (Type A).
The author



suspended from a pole; a 6 cm flat ring is common on the Kent chests.⁴⁰ All of the Kent chests have their original lids.

From past research and by examining the 15 Kent chests, four types of domed chest can be distinguished by variation in their ironwork.⁴¹

⁴⁰ A Norse origin has also been suggested for the iron suspension rings [Eames (1977), p. 135].

⁴¹ Sherlock divides the Suffolk chests into two types based on their ironwork. His 'complex' type includes Types A and B here, while his 'simple' type corresponds to Types C and D [Sherlock (2008), p. 31].



6 Canterbury Heritage Museum chest (Type B). *The author*

TYPE A This consists of completely armoured chests. These vary greatly in quality. Examples of high quality chests sheathed in iron and with wheels exist at the Gruuthuse Museum, Bruges,⁴² and Sidney Sussex College and St John's College Cambridge (Figures 4 and 5). The Sidney Sussex College chest may represent the highest quality since as well as being wheeled and armoured, it has a highly complex and decorative locking arrangement with four locking bars. In Kent the two completely armoured chests, at Ash (Figure 1) and Sandwich, are of lower quality.

TYPE B This consists of chests with six or more vertical straps on the lid and horizontal straps, forming a grid. Examples in Kent are at Ashford, Canterbury Heritage Museum (Figure 6), Mereworth, Northfleet and Ramsgate. The first four have similar ironwork; the Ramsgate chest is atypical and may represent a sub-type.

TYPE C These chests have 3–5 vertical straps on the lid and may or may not have horizontal straps. In Kent such chests are at Canterbury St Dunstons, Faversham, Fordwich (Figure 7), Harbledown, Higham and Ickham.

TYPE D These chests have only two hinges from which two straps extend little more than half way towards the front of the lid. The strap leading to the single central hasp does not reach the back of the lid. There are two examples in Kent, at Lower Halstow (Figure 8) and Minster.⁴³

⁴² Eames (1977), pp. 173–77.

⁴³ Examples of Type D chests in Suffolk are at East Bergholt, Martlesham, Mendlesham 1, Pakenham (with two later locks), Walberswick and Wattisfield, and in Norfolk at Ludham. The St Leonard's Zoutleeuw and Gollern chests mentioned above are also of this type.



7 Fordwich chest (Type C). *The author*



8 Lower Halstow chest (Type D). *The author*

The number of rear hinges is related to type and length: Type A have 7–9 hinges; B 5–9, C 3–7, and D 2. A few chests have a widened type of hasp hinge to give extra protection against entry (Ash, Sandwich, Canterbury Heritage Museum and Northfleet). Type A and B chests have an iron flange covering the end grain of the lid but this is absent on all but one of the Types C and D chests (Higham). It is likely that Type A and B chests were more costly to make than Types C and D because of the greater amount of ironwork involved.

Table 1 shows that examples of all four types of chest are found in both Kent and Suffolk and that armoured chests are rare in both counties, but that Suffolk has a larger proportion of Type B and D chests than Kent which has a bigger proportion of Type C chests.

TABLE 1 Numbers of pine chests in Kent and Suffolk by type

TYPE	A	B	C	D	TOTAL
Kent	2	5	6	2	15
Suffolk	1	11	7	6	25*

*NOTE: Of the 28 Suffolk chests three have replacement lids and so cannot be classified with certainty

The most noticeable variations among the Kent domed chests are in their size and ironwork. They range from 96–165 cm in length but the commonest size is 130–150 cm (9 out of 15); their height ranges from 50–74 cm and depth from 44–69 cm (see Appendix 2, Table A1). Type D chests, which have the least ironwork, seem relatively taller than the other types — perhaps they were a cheaper and more capacious product. One chest has a pine lid (Ashford) but all the others are of a pale light wood.

The nails used to secure the iron bands on the chests are of one or both of two types: round headed nails and nails with a rectangular head showing two angled faces or facets which will be referred to as a gabled nail (Figure 9). These are discussed below. Secondly, in almost all Type A and B chests the hinges are held using clenched nails, whose tips were bent over a rove for added security (Figure 10) This is an indicator of good quality manufacture. Details of the nail types and roves are given in Appendix 2, Table A2.

The Kent chests all have or had a single central lock concealed under a single lock plate, and lock flap, on either side of which in the Types A–C chest there were two staples over which fit two hasps hinged from the lid.⁴⁴ These could have allowed fixing by two padlocks or the insertion of a locking rod with a single padlock. At a time of insecurity when multiple locks were common on chests the single locks are notable.

Some chests have lids with more than two hasps and some chest fronts have additional staples through which a locking rod would have been secured. The most complex

⁴⁴ At Lower Halstow, there are recesses which would match a double lock but no signs of a double lock plate as at Southwold and Walsham-le-Willows in Suffolk. Among the Suffolk chests is one with two locks (Wyvestone), but none of the Kent chests are of this type.

9 Gabled nails,
Canterbury Heritage
Museum chest.

The author

10 Clenched nails and
roves, Ash chest.

The author



locking arrangements are on the Ash (Type A) and Canterbury Heritage Museum (Type B) chests. Both have additional staples for a locking rod (extant at Ash), and a key flap, adjacent to the lock flap, that covers the key hole and fits over an additional staple below the lock plate and is fixed with a padlock. As a rule, Types A and B chests have more complex locking arrangements than Type C chests. Type D chests, with their single central locks, are liable to have been supplemented later, as at Minster, where locks were added in the seventeenth century. The lock plates, where original, are either slightly or markedly concave-sided (with additional decoration in some cases), except at Ramsgate which has a rectangular lock plate with a U shaped key guide and decorated hasp. They will be discussed below.

The chest ends bear from one to five vertical straps and Types B and C chests may have a number of horizontal straps which wrap round the corners to appear on the front and back of the box. Some chests have full height corner brackets; others (e.g. Type D) have short corner brackets, sometimes butterfly-shaped.

For transport the chests were supplied with suspension rings or triangles; one has additional triangles at front and back (Northfleet). These vary in size and shape around the norm of a flat 6 cm ring. In only one chest, at Northfleet, is it possible to see the metal bars by which the two rings were linked to a suspension pole which would have been held above the chest along its axis.⁴⁵

Most of the chests with probable original surfaces have a maroon stain; at Faversham and Ramsgate this is concealed under later stains. One chest (Higham) shows tinning on the ironwork.

In relation to the question of whether domed chests are associated with churches, the 15 Kent chests include three which are not in churches. The Faversham chest, now in a museum, was previously in a church to which it was bequeathed by a local businessman, Henry Hatch. His will of 1533 states that he bought it from Henry Estrey of London, a clear example of a secular use. Likewise, the Fordwich chest was used to store the records of the town council. Nothing is known about the previous life of the Canterbury Heritage Museum chest. With one exception (Ickham, recorded as a gift of a sheriff of London) there is no information about how the other 12 chests came to be in churches.

Finally, Appendix 1 gives the results of the dendrochronological study of the Fordwich chest. This chest has a *terminus post quem*, i.e. a date after which it must have been made, of 1374. However the precise number of years to be added to this date depends on the allowance made for missing sapwood, which in pine can be large. The previously dated Mendlesham 1 pine chest had a last ring date of 1417 and was estimated to have been felled in the 1420s and the chest made soon after.⁴⁶ For the Fordwich chest, Appendix 1 concludes that 'the boards used are likely to have come from a tree felled around the beginning of the fifteenth century, making this chest similar in age to the Mendlesham chests, or possibly a decade or so earlier'. As for the Mendlesham chests, the best fitting pine chronology was from northern Poland. The only other potential date for a Kent domed chest is the 1394 documentary date for the Ickham

⁴⁵ These can also be seen on the St John's College chest in Cambridge (Fig. 5) and in Lewer and Wall (1913), pp. 25–28.

⁴⁶ Bridge and Miles (2011).

chest (see Appendix 2). Unfortunately the dendrochronological dating of the three Kent chests, which were of different types (A, B and C), led to a date only for the Type C Fordwich chest. The Mendlesham 1 and 2 chests are of Types D and C respectively, suggesting that these two types at least were made contemporaneously.

ANALYSIS AND INTERPRETATION

There is no doubt that domed chests, as defined here, have recognisable similarities: their shape, the combination of pine box and dug-out lid and their ironwork are distinctive. One could conclude that these features in themselves guaranteed that they had a common origin. The approach used here goes beyond this. The argument focuses on five specific features, two of which (dug-out lid and pegged splayed rabbet joint) are found on all the domed chests studied and three of which (divided tills with decorative partition, gabled nails, clenched nails) are found on a significant proportion. It is argued firstly that all five of these features are atypical of chests in England and secondly that some or all are also found on domed chests on the Continent, and that this makes it more likely that domed chests are imported, especially given the eastern/coastal geographical distribution of the domed chests in England. Thus the possibility, discussed earlier, that the domed chests were made in England of imported wood is considered inconsistent with this more detailed evidence. Our argument remains based on probabilities since it depends on systematic knowledge about early English and Continental chests which is largely lacking. Hence the argument may need to be modified as knowledge of early chests generally and domed chests in particular expands.

i) THE DUG-OUT LID Dug-out chests are a well-known type but to my knowledge there is no English tradition of chests with dug-out lids alone. This in itself suggests that they belong to a different tradition.

As has been shown, a variety of woods have been suggested for the lid timber. Cescinsky and Gribble's choice of poplar has been followed by many writers. Pine lids have been found on three chests in Suffolk and putative willow lids at Diddington, Cambridgeshire and the Pyx Chapel.⁴⁷ The Stralsund and Skrukeby chests, discussed below, are said to have birch lids but from photographs supplied to me the lid of the Skrukeby chest looks identical to the lids of the Kent chests, though this remains to be checked by microscopic analysis. However, the only previous lid to have been analysed with a microscope was at Little Waldingfield, Suffolk which proved to be lime.⁴⁸

As far as the Kent chests are concerned, loose fragments from six lids were analysed by Adam Bowett: Canterbury Heritage Museum, Fordwich, Ickham, Lower Halstow, Mereworth and Minster. In each case they proved to be lime, a tough but lightweight wood which had not been mentioned in any of the previous writing on domed chests. The Minster chest was the one which Roe identified as elm and oak; this can now be corrected to pine and lime. One lid, at Ashford, was pine. Another, at Sandwich, could not be seen as the chest is locked and armoured.

⁴⁷ The former is referred to in Simpson (2008) but it is not certain that this was based on microscopic analysis [Gavin Simpson, personal communication, June 2012]. Celia Jennings has confirmed that her identification of willow was visual [Personal communication, June 2012].

⁴⁸ Adam Bowett, personal communication, March 2012.



11 Fordwich chest, internal view. *The author*

Unfortunately, the earlier argument about the absence of pine outside Scotland does not apply to lime. Lime was grown in England and Salzman records it as being used in the thirteenth and fourteenth centuries for tables, benches, dressers, stalls, doors and scaffolding, though he says it is ‘of rare occurrence’.⁴⁹ Lime was also imported and Childs reports lime boards being imported to Hull from Danzig in the fifteenth century.⁵⁰ However, she does not record lime trunks being imported, which would be necessary if the dug-out lids were made in England. The fact of lime board exports may indicate that lime had low value in the area within reach of Danzig and is thus consistent with its being used there to make dug-out lids. Thus not only is there no English tradition of making chests with dug-out lids on top of boarded boxes, but there is no evidence of lime being used for dug-out lids in England; however, its availability does not rule this out absolutely.

2. THE DIVIDED TILL BOX WITH DECORATIVELY CHAMFERED PARTITION This very distinctive feature is found on eight out of the 13 Kent chests which were unlocked (Figure 11).⁵¹ The partition projects above the level of the two lids and has a downward sloping top edge with between one and four scallop-shaped stopped chamfers on each

⁴⁹ Salzman (1966), pp. 251–52.

⁵⁰ Childs (1986), pp. 80 and 206.

⁵¹ Jennings appears to be the first scholar to note the existence of the divided till, in the Type A chest in the Chapel of the Pyx [Jennings (1974)]. It also has a hidden lower till.

side.⁵² In my view, this feature helps to distinguish domed chests as a category from other boarded chests in England where, to the best of my knowledge, divided tills with a decorative partition are unknown. It also lends support to the argument that they are imported or made by craftsmen working in a different tradition. Divided tills were also found on at least 38% of the Suffolk domed chests.⁵³ It is not being claimed that divided tills are a universal feature of domed chests but that there is an association between them which merits further study since it is atypical of chests in England and potentially supports the ‘imported chest’ interpretation.

There is an association between divided tills and Type C chests in Kent as shown in Table 2, i.e. all but one such chest had divided tills. However, in Suffolk divided tills were distributed more evenly across the four types of chest. These differences could be due to recording differences and/or to the small numbers of domed chests in the two counties.⁵⁴ To establish whether there really is an association would require a larger scale survey.

Table 2 Proportion of each type of chest having a divided till, by county

TYPE	A	B	C	D	TOTAL
Kent	1/1	1/4	6/7	0/1	8/13*
Suffolk	0/1	3/11	3/7	3/6	9/25*

*NOTE: There were two locked chests in Kent, and the Blaxhall (Suffolk) chest is omitted as it had a later lid so cannot be grouped by Type.

Turning to domed chests on the Continent, the features of six chests are shown in Table 3. This shows that two chests have divided tills, the Skrukeby chest and a chest at the Gruuthuse museum. This shows that they are not a universal feature of Continental domed chests, as was true of the Kent and Suffolk chests. Hopefully, future research will explore whether chests with divided tills form a specific sub-group. The Skrukeby chest is interesting for an additional reason. As well as a divided till box on the left with triple scallop chamfering on the partition, it also has as a shelf with upstand on the right (Figures 12–14). In both respects it is identical to the Fordwich

⁵² Similar chamfering can also be found externally on the side rail of the lid on clamp-fronted chests in England from the late twelfth-century Deep Chest in Westminster Abbey onwards [Johnston (2001); Miles and Bridge (2008)]. It can be found internally on the underside of the lid on the mid-fifteenth-century Flemish Boughton Monchelsea chest [Christie’s, 1999].

⁵³ This figure is based on the following ten chests out of the total of 28 Suffolk chests: Blaxhall, Hadleigh II, Little Cornand, Martlesham, Nayland, South Elmham St James, Thornham Parva, Walberswick, Wattisfield and Westhope. However, two of the chests were recorded as locked and David Sherlock tells me he did not always record which ones were locked. So the true total figure for Suffolk chests with divided tills is at least 10 out of 26 (38%).

⁵⁴ For example, in one case (Canterbury Heritage Museum) I took the existence of a hole where the partition is attached to the side of the chest as evidence of a divided till, although there was a later undivided till. The St John’s, Cambridge armoured chest has similar evidence of a previous divided till.

Table 3 Details of six domed chests in continental museums

<i>Location or origin</i>	<i>Pegged splayed rebated joint</i>	<i>Till</i>	<i>Other details</i>
Skrukeby, Nordiska Museum, Sweden (Inv. no. 49640)	Yes	Divided till with decorative partition on left; shelf with upstand on right	Pine box. Five vertical bands on lid; no horizontal bands. 3 Hinges Large, flat-domed, round headed nails to hold straps. No roves. Large, very concave foliate lock plate. No further hasps and staples. Original condition
Stralsund Museum, Germany	Yes	Previously one on left; probably not divided	Pine box. 7 hinges. Rectangular roves in pairs, Large, domed, round headed nails. Later concave sided lock plate with hasp and staple on each side. Otherwise probably original condition
Kwidzyn Castle Museum, Poland	Yes	On left. Not divided	Pine box. 9 vertical bands, 3 horizontal bands probably inset into surface; Large, domed, round headed nails. Central plain lock plate, slightly concave, with hasp guard and short key guide. Hasp and staple on either side. No roves. Original condition probably. Dark red stain 105 × 55 × 44 cm
Elbląg Museum, Poland	Yes	On left. Not divided	Pine box. Now with 7 vertical bands and 3 horizontal bands. Much of the the ironwork has been replaced including a concave sided lock plate; a little original ironwork on ends (and lid) remains. Large, round, flat domed nails but some gabled nails on lid: both are probably later. No roves
Olsztyn Museum, Poland (Inv. no Mb-62-OMO)	Not seen	Not seen	Now with 6 vertical and 4 horizontal straps on lid, the product of repair/rearrangement. No lock plate now; instead four hasp and staple fixings. Nails are large, round but not domed
Gruuthuse Museum, Bruges (Inv. no 103307)	Yes	Divided till on left side and possibly right side too	Seven vertical bands on lid; no horizontal bands. Rectangular probably later lock plate with hasp guide; two hasps and staples on either side. Some gabled nails? Also pyramid headed nails. 136 × 72 × 56 cm (The 72 cm height makes this a tall chest.)



12 (above) Skrukeby chest, front view.
*Reproduced by permission of the
Nordiska Museum, Stockholm*

13 (right) Skrukeby chest, internal
view, left hand side



14 (below) Skrukeby chest,
internal view, from above





15 Fordwich chest, internal view, left hand side showing divided till. *The author*

16 Swedish chest (slightly domed with carving, to show a close relative). *Reproduced by permission of the Nordiska Museum, Stockholm*



chest (Figures 7, 11 and 15).⁵⁵ This provides an intriguing link. Given the westward direction of medieval timber flows, it supports the idea that both chests are products of the eastern Baltic.⁵⁶ In this connection, it should be noted that the Skrukeby chest is the only plain chest among a set of chests at the Nordiska Museum with shallow domed or flat lids and all-over chip, foliate or scroll carving.⁵⁷ Figure 16 illustrates one of these. Such carved decoration does not have parallels in Germany that I am aware of and one might conclude that they represent a Swedish type. If so, this would

⁵⁵ Both have big concave-sided lock plates, the Skrukeby one has pierced relief foliage decoration around the hasp guard while the Fordwich one has plain outline decoration. The Skrukeby chest has five lid straps as probably did the Fordwich chest (three only now) but they differ in the nails used.

⁵⁶ Bonde et al. (1997); Childs (2002); Malowist (1987); Postan (1987).

⁵⁷ von Schoultz (1949). The carving on the chest in Figure 16 was added before the ironwork. Likewise, the St Leonard's Zoutleeuw chest has a merchant's mark underneath the ironwork [Simpson, 1998]. The latter is consistent with the producer making the chest to order of a merchant, rather than for the general market, or else to the merchant identifying a chest prior to the addition of ironwork on its way to the market.



17 Kwidzyn chest. *Reproduced by permission of Kwidzyn Castle Museum*

reinforce the idea that the Skrukeby chest was imported to Sweden and that Sweden is not the source of these chests (or at least not the sole source.) However, such arguments rest on assumptions about how far the distribution of the surviving chests is representative of that of the original chests.

3. PEGGED SPLAYED REBATE JOINT A further distinctive feature of the domed chests is the pegged splayed rebate joint (Figure 3). This joint is superior to the usual simple butt joint since the splay and stop provide resistance to pressure on the sides of the chest from outside or inside, as well as some sealing against the entry of air or moisture.⁵⁸ In addition, this joint is normally strengthened by iron corner brackets or straps. The joint was found on 10 or 11 of the 11 inspectable Kent chests.⁵⁹ Whether this feature is found on all domed chests elsewhere in England would be interesting to know. I am assuming that that this joint is atypical of boarded chests in England; this requires further research. Table 3 shows that this joint was also present on the five domed chests on the Continent for which we were able to obtain internal photos, Skrukeby, Bruges, Stralsund, Elbląg and Kwidzyn (Figure 17), supporting the idea that all the domed chests have a common place or region of origin.

⁵⁸ Thanks to Adam Bowett for these points.

⁵⁹ The Sandwich chest was locked; but on the locked Minster chest a damaged corner revealed the joint. The Ashford chest had a mortise and tenon joint visible at the top but pegs attach the sides to the front and back, as on the other chests, which suggests that it concealed a rebated joint.

4. NAILS The most common type of nail used to hold on the iron straps of the Kent chests has a round flat head, which varies in size; dome-headed nails are uncommon. Other shapes such as rose heads were not found. However, one type of nail appeared on 10 of the 15 Kent chests — the gabled nail whose head could be up to 2 cm long. It was used either exclusively, i.e., without any round-headed nails (four cases), or else in combination with round-headed nails (six cases — see Appendix 2, Table A2). In the latter case, it was always used to attach the lid bands only or both the lid and front vertical bands, with round-headed nails being used to attach the remaining bands. It appears that it was used in the most prominent positions either for functional reasons (the large head giving better security against entry), decorative reasons or both. The gabled nail head is very striking because it is carefully worked and was presumably more expensive to make. The question is whether it can be used to provide evidence of the origin of domed chests?⁶⁰

Assuming nails were primarily a locally sourced product, they are a potentially useful indicator of the origin of a chest (and of the place where it was later repaired).⁶¹ However, they are only practically useful if they vary and different types are associated with different places. The general problem of using such indicators is that there is rarely a perfect match between indicator and underlying subject of interest (e.g. place of production). This would require that the indicator was always and exclusively found in objects from the place in question. More commonly there is a less strong relationship. An indicator which is not found on every object from the place in question but is not found elsewhere is almost as useful. An example of this is the cross-tongue joint used to join two boards which is not used in every piece of Welsh furniture but does not appear to be used outside Wales, so it can be used as an indicator of Welsh origin.

It is argued here that the gabled nail may be an indicator of this type because it is found on some but not all domed chests, and because like the divided till with decorative partition, it does not seem to be found on flat-topped iron-bound chests in England. This claim, which implies a fairly high degree of association, is based on an examination of the photos of iron-bound chests in Geddes, the large number of such chests at flickr.com and www.larsdatter.com/chests, and on consultation with a number of British specialists who say they have not encountered the gabled nail. The gabled nail is also not one of the 12 types of nail head shown by Goodall in his survey of medieval ironwork.⁶² However, the claim needs to be tested further.

⁶⁰ This type of nail also appears on domed chests at King's College Chapel, St Botolph's and the University Registry (Cambridge), Meldreth (Cambs.), Frampton Cottrell (Glos.), Watton on Stone (Herts.), South Creake (Norfolk), Hawstead (shallow lid), Long Melford, South Elmham St Cross, Thornham Parva and Westhorpe, (all Suffolk), Steeple Ashton and West Lavington (Wilts.), and Hawton Minster (Yorks.), Pictures of the Glos., Herts., Norfolk and Suffolk chests are on flickr.com.

⁶¹ Geddes says that English iron was used for nails, horseshoes, wedges, spades and pickaxes whereas imported iron was used for weapons and siege engines [Geddes (1991), pp. 168–69]. Salzman quotes examples of Spanish and Normandy nails but says that 'references to imported nails are rare before [1532]' [Salzman (1966), p. 316]. The 1480–81 customs records for London record nails arriving on over 20 boats but their origin — Continental or domestic — is never clear [Cobb, 1990].

⁶² Goodall (2011), pp. 163–64, 363–64. While comprehensive in terms of the range of objects covered, in the case of nails this study is based on a limited number of sites and so may not be definitive.

Turning to the Continent, we have found gabled nails on four chests in the Baltic or Scandinavia. The first is described as a thirteenth-/fourteenth-century 'alms-log' from Svinnergarn church, Sweden, which is a long, narrow, dug-out, trunk-shaped chest covered with multiple iron straps held by these nails.⁶³ The second is a large, long, rectangular, flat-topped chest at the Red Monastery at Cerveny Klastor, Slovakia (near the Polish border, south of Krakow).⁶⁴ The third is the Olsztyn domed chest which has gabled nails along the front of the lid.⁶⁵ The fourth is an oak chest at the Weinhausen monastery in the Luneberg Heath area which has a slightly curved lid and is dendro-chronologically dated to 1328.⁶⁶ This evidence further associates the gabled nail head with Sweden, Germany and Poland. It is not definitive since the chests may not be in their place of production, but this seems very unlikely in the case of a heavy dug-out chest. The fact that three of these four chests are not domed suggests that they were produced in a region where gabled nails were widely used.

Finally, returning to nails that are not gabled, Table 3 shows that the first four chests all have large flat domed nails. They are also found on a shallow-domed chest in Sweden, illustrated in Mercer (1969), figure 22. These are found on some Kent chests; e.g., Higham; and some Suffolk chests; e.g., Chelsworth, Hadleigh I, and Wyverstone. There are thus some features which connect these four chests to the English ones, but others which suggest they are a partly differentiated group.

Clenched nails can be found in 8 of the 12 Kent chests inspected (see Appendix 2, Table A2).⁶⁷ They are visible inside the chest as a row along the rear of the lid and top of the back where they reinforce the lid hinges (Figure 10). The chests with clenched nails had on average 6.75 rear hinges, whereas those without had 2.7, so there is a tendency for chests with more hinges to be more likely to have clenched nails. The number of clenched nails used per hinge fixing varies from 1 to 3 and the shapes of the roves include squares, rectangles, lozenges, and snippets. Clenched nails also appear on the Stralsund and Kwidzyn chests with their multiple hinges, but not on the Skrukeby chest with its three hinges.

The presence of clenched nails raises a question for research. Ideally one would like to know whether clenched nails are found widely in iron-bound chests in England, or whether they are a further unusual feature of (especially the larger) domed chests. This will involve opening the chests. External photographs are of no help.⁶⁸

5. LOCK PLATES The final feature of the Kent chests to be discussed is the lock plates. All but one of the original lock plates are either plain and slightly concave sided or, as at Fordwich and Harbledown, large (25 × 23 cm and 30 × 30 cm respectively) and

⁶³ Anker (1975), p. 8.

⁶⁴ www.larsdatter.com/chests

⁶⁵ This chest poses a problem since it has undergone renovation and it is not clear from the photo whether the gabled nails are new or old. However, even if they are new they are likely to be replacements for similar originals.

⁶⁶ I am indebted to Karl Heinrich von Stülpnagel for this information. A photograph of the chest appears on p. 38 of his book but is too small to reveal this detail.

⁶⁷ Two chests were locked and in two I forgot to check.

⁶⁸ If future research does suggest that this is a distinctive feature of domed chests it may be connected with the medieval shipbuilding tradition in northern Europe where the clinker-built style requires complex nailing to secure overlapping planks [Bill (1994); Friel (1995)].



18 Harbledown chest,
lock plate. *The author*



19 Fordwich chest,
lock plate. *The author*

deeply concave sided with flaring key guides with leaf decoration (Figures 18 and 19).⁶⁹ The Harbledown lock plate has a slider with an acorn finial that has to be released to allow the key to be inserted; the Fordwich lock plate has no slider.⁷⁰

There are two problems in the study of lock plates; being certain that a lock plate is not a later replacement, and inferring dates from them. In general, medieval ironwork is a field in which practices remained unchanged over long periods, which effectively prevents its use for close dating.⁷¹ For example, concave sided lock plates have been dated to 1300–1550 but these dates are not based on systematic study.⁷² As a result it is more usual for lock plates to be dated from chests or doors than for lock plates to be used as resources for dating.

⁶⁹ On the two armoured chests the lock plates are close to rectangular but show slight concavity. This may be because very concave sides would mean more wood was revealed which would contradict the idea of armouring. Hence their shape is constrained by functional requirements. However, the Cambridge Registry chest shows another solution: it is armoured, wheeled and has a deeply concave lock plate super-imposed on the armouring.

⁷⁰ Five of the 28 Suffolk chests have similar lock plates to these two, East Bergholt, Finningham, Glemsford, Little Waldingham, Martlesham, and Pakenham, but none has been dendrochronologically dated.

⁷¹ Geddes (1999), pp. 3–8.

⁷² Chinnery (1979), p. 144.

Dendrochronology can provide some help here. Geddes dates a slightly concave sided lock plate on the door to the Zouche Chapel, York Minster, to *c.* 1395, and follows Eames in dating the Flemish ‘St George’ chest in York Minster, which has a similar elaborate lock plate to those at Fordwich and Harbledown, to *c.* 1380 based on the style of carving of the chest front.⁷³ However, this may be too early as the similarly-carved Flemish Boughton Monchelsea chest is dendro dated at *c.* 1435–60.⁷⁴ To these points of reference can be added the plain slightly concave sided original lock plates on two German plain clamp-fronted chests dendrochronologically dated to 1322 and 1349.⁷⁵ These may be the earliest dates for such a lock plate. The same author shows a more concave sided lock plate on a similar chest dendrochronologically dated to 1375. Another date can be taken from the tracery-carved clamp-fronted Faversham chest which has a concave sided lock reserve, but no lock plate, and is dated to 1389–1420.⁷⁶ The Fordwich chest, dendrochronologically dated to the early fifteenth century, is in line with these dates.

Finally, some evidence from the two decorative lock plates can be mentioned. The Harbledown chest has a hasp which has a segmented design with alternate stippled and plain segments on its upper part (like that shown in Eames but with eight rather than six segments), above which there is a star shaped stippled design.⁷⁷ The Ramsgate chest has a rectangular lock plate with an eight segment stippled design.⁷⁸ The similar hasp decoration on the Greater Treaty Chest in the Pyx Chamber, Westminster Abbey was dated by Eames to 1480 based on dendrochronological work by Lowther.⁷⁹ However, recently this chest has been re-dated as having a felling date of 1379–95 (Miles and Bridge, 2008). A date range including this date range can therefore be applied to the Ramsgate and Harbledown chests, and to the flaring key guide as found at Harbledown.

In sum, there is good evidence of concave sided lock plates from 1322 onwards, of hasps with segmented designs and of lock plates with a flaring key guide from the late fourteenth century, but we do not know over what range of dates these types were in use.

Geddes suspects that ‘leaf locks’ (i.e., concave sided with leaves around the hasp guard) are either imported or local imitations and notes that locks were among the imports mentioned by anti-Dutch rioters in 1517.⁸⁰ Their presence on the early Luneberg Heath monastery chests studied by von Stülpnagel suggests they may originally have been German in origin, north Germany being known for its early development of the iron industry and for being close to the Lorraine and Meuse areas reputed for artistic metalwork.⁸¹

A final point of interpretation concerns the four types of domed chest. It is always appealing to treat historical development as a linear evolution from the simple to the

⁷³ Geddes (1999), pp. 219 and 233.

⁷⁴ Christie’s (1999). Unfortunately this chest had a later lock plate.

⁷⁵ von Stülpnagel (2000), pp. 111, 246 and 274.

⁷⁶ Pickvance (2007).

⁷⁷ Eames (1977), p. 149.

⁷⁸ See also von Stülpnagel (2000), p. 110.

⁷⁹ Eames (1977), p. 149.

⁸⁰ *Ibid.*, p. 234.

⁸¹ Haedeke (1970).

complex, as for example in the notion that dug-out chests were replaced by boarded chests which were replaced by framed and panelled chests. In practice, economics as well as construction technology plays a part; boarded chests continued as cheaper forms after the introduction of framed and panelled chests and 'late' dugout chests exist too. In the case of the domed chests it is suggested that the four types of domed chests were probably available simultaneously and corresponded to different prices and clienteles, rather than that Type D was replaced successively by Types C, B and A. However, the wheeled, armoured variant of Type A chests, which would be affordable by the wealthiest institutions and social classes, may be an exception, and may have started later and continued into the sixteenth century, after production of the lesser types of domed chest had probably dwindled. For example, the V&A has a wheeled, armoured, domed chest, 114 × 83 × 64 cm, dated 1597 and described as German (Inv no M244-1912) which has similar small headed nails to the wheeled armoured chest at St John's, Cambridge.⁸² What wood they are made of remains to be studied. Dendro-chronological dating of the different types of chest will hopefully allow the question of sequencing to be examined.

CONCLUSION

The main problem in the study of domed chests is that there is almost no direct evidence on their production, transport, sale, ownership or use. This has opened the way to two main hypotheses regarding their origin — domestic production or importation. The existence of imported pine and domestic lime in the fifteenth century would have allowed them to be made in England, but three features of their location — the fact they are concentrated in England, concentrated in the east coast counties, but also found in smaller numbers in continental Europe — and the direction of trade in wooden objects suggest that they were imported. Differential survival rates can in principle account for differences in geographical distribution, but the above features are so striking that the most parsimonious hypothesis is that domed chests were an export product aimed at the English market, with smaller numbers being sold to other countries. This leaves open whether this development was led by final purchasers, by Hanseatic merchants, or by producers finding a new use for their resources of timber, iron and skilled labour, or by some combination of these.

This article has drawn together the evidence on domed chests based on the Kent and Suffolk examples and included some located on the Continent not previously analysed. It could be suggested that domed chests were self-evidently made in one place because of their similarities in shape and timber. I have not been satisfied with this view and have built my interpretation of the Kent (and other) domed chests on an analysis of six further features. It has been argued that the chests have two invariable distinctive features, the dug-out lid and the pegged splayed rabbit joint, and four further commonly associated features, the divided till with decorative partition, gabled nails, roves, and concave sided lock plates. Taken together these are almost certain evidence that domed chests belong to a highly distinctive Continental production tradition, most

⁸² The Gruuthuse Museum also has a chest, 141 × 67 × 52 cm, described as sixteenth century (Inv. no. 103318).

probably from parts of Germany and Poland. However, claims about what is distinctive depend on there being a good knowledge of what is ‘normal’, and in this respect early chests are an under-researched field. For example, a basic knowledge of the joints used in the construction of boarded chests and the nail types used in attaching ironwork is lacking. It follows that the differences between the Kent, Suffolk and Continental chests are secondary in nature.

Domed chests appear to be an initiative of producers or merchants in or near parts of Germany and Poland which were then Prussia, building on the export of raw materials such as timber and iron, and Danzig appears to have been the main port of origin. In general, ports acted as collection points for goods produced over a much wider area, but in the case of the domed chests, dendrochronological analysis of the pine supports the Danzig region as the place of origin, and it seems more likely that domed chests were made near to the port from trunks floated down river and converted in situ than that they were made near to the forest timber sources, due to the relative cost and ease of transport of trunks and chests.

Regarding the period of production of domed chests, our dendrochronological results differ only a little from the Mendlesham result but leave open the period over which domed chests construction continued. Only two of the Kent domed chests have left a documentary trace — the Faversham and Ickham chests (see Appendix 2). Whether London was the port at which all the Kent chests arrived, rather than Sandwich, remains unknown.⁸³

FUTURE RESEARCH

A number of directions for future research can be suggested. Apart from the need for more research on early chests in general, and on nails and joints specifically, there is a need for more research on domed chests. Firstly, more dendrochronological studies are needed to determine the period over which domed chests were made, and whether the four types of chest show different temporal patterns. Domed chest production had started by the early fifteenth century, but how long it continued remains unknown. The production of chests of the highest quality may have extended well into the sixteenth century, but whether it took place in the same places as the fifteenth-century production, and whether it continued to use pine and lime, remains to be studied. Knowledge of dates will also contribute to the dating of lock plates and other ironwork. Secondly, microscope-based analysis of lid timber is needed to establish whether willow, poplar or birch were ever used or whether they were mistaken for lime. Thirdly, more county level studies will help to establish whether, if county level differences exist, they are best understood as random variations around a common pattern, or whether, for example, they are due to different counties being supplied by ships bringing chests from different sources, or to ironwork being added in locations with different traditions. The search for correlations between features of domed chests in particular counties

⁸³ A recent publication notes the arrival of ships from Danzig in the fifteenth century [Clarke et al. (2010), pp. 121–30].

will be helpful. Fourthly, there is scope for further study of domed chests on the Continent. Again, this should establish whether they differ systematically from those in England or whether, as suggested here, they appear to show secondary variations around a common theme, as in the case of the nails on the Skrukeby chest which has so many similarities with the Fordwich chest. Fifthly, more studies of documentary sources are needed in the hope of finding references to identifiable domed chests in inventories or customs records, or datable illustrations.

There is also a case for studying what can be called 'related' chests which include chests which did not meet the definition adopted, and those which share some of the characteristic features of domed chests but are not domed. Shallow-domed chests included in Sherlock's Suffolk study (e.g., Beccles and Gorleston) deserve to be included. Domed chests with non-pine boxes (as at Hawstead and Monks Eleigh (oak) and Risby (elm), or with original flat lids as at Risby, all excluded from the Suffolk survey) deserve study, as do non-pine chests with a divided till with a decorative partition (as at Monks Eleigh) or with gabled nails (Hawstead, Suffolk and the Weinhausen monastery as shown in von Stülpnagel). These 'related' chests, not (yet) found in Kent, can potentially throw light on the 'pure' domed chests. The fact that some features of domed chests are found on related types of chest is not surprising. My hypothesis would be that they too are Continental products; one would not expect one product to be totally distinctive from all others in the same region of production.

Finally, a second question of definition concerns the differences among domed chests.⁸⁴ If domed chests were made over a 100–200 year period and possibly in more than one location (e.g., in parts of today's Poland and perhaps Sweden or Germany) with partly distinctive traditions of woodwork or metalwork it would be surprising if they did not show some diversity. Major ironwork is the basis of the typology used here but there are many other types of difference, as shown in Tables A1 and A2, relating to the nails, roves, locking arrangements, ironwork on the front and ends, forms of suspension, etc. Still others were recorded but were not included in the tables, e.g., the thickness of the iron used in the straps,⁸⁵ and the quality of the ironwork. It is always a matter of judgement how far such differences among domed chests are compatible with their having a single place of origin, or at what point they are taken as evidence of multiple origins. This too remains a task for future research.

⁸⁴ The fact that they almost always have a single lock could have been included in the definition but was not for reasons of simplicity. This would have excluded the chest shown in Chinnery and two chests in Suffolk.

⁸⁵ Geddes argues that in England until the thirteenth century iron was more valuable and used in thinner gauges than subsequently [Geddes (1999), p. 7].

ACKNOWLEDGEMENTS

I would like to acknowledge the support of grants from the Marc Fitch Fund and Regional Furniture Society, Adam Bowett for wood identification, and Martin Bridge for dendrochronological analysis and an unpublished report. I would like to thank David Sherlock for the loan of his Suffolk domed chest photos and gift of documents, Gavin Simpson for permission to include updated versions of his record of domed chests and of the distribution map, and for showing me unpublished work. Chris Currie suggested the term ‘pegged splayed rebate joint’, and John Stabler coined the ‘gabled nail’. Also Roderick Butler, Wendy Childs, Aoife Daly, David Dungworth, Jane Geddes, Gillian Hutchinson, Charles Indekeu, Pelham Olive, Richard Pickvance, Agata Rozpedek, Krysta Ryzewski, Sheila Sweetinburgh, John Vince and Davide Zori for advice on nails, metallurgy, woodwork, historical sources, and translations, and curators at the following museums for advice and supplying photos (marked*): Nick Humphrey, Angus Patterson and Alicia Robinson (V&A), Achim Stiegel (Kunstgewerbe, Berlin), Karl Heinrich von Stülpnagel (Leipzig), Kristel Van Audenaeren* (Gruuthuse, Bruges), Annica Ewing and Anna Womack* (Historiska and Nordiska, Stockholm), Poul Grinder-Hansen* (National, Copenhagen), Sybille Köpke* (Stralsund), Łukasz Stawski* (Kwidzyn), Wiesława Rynkiewicz-Domino* (Elbląg), and Katarzyna Dauksza (Olsztyn). For access to the Kent chests I thank David Cave (Ash), Robert Blount (Ashford), Craig Bowen (Canterbury Heritage Museum), Arthur Percival (Faversham), Roger Green (Fordwich), Sidney Denham and Jill Rayner (Harbledown), Alan Amos (Lower Halstow), Michael Derbyshire (Mereworth), Bob Coles (Minster), Lawrence Smith (Northfleet), and the Parish Office (Ramsgate). The recording grid used in this research is available to researchers on request.

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APPENDICES

Appendix 1

Preliminary dendrochronological investigations of three pine chests in Kent

Dr Martin Bridge, Oxford Dendrochronology Laboratory

Background to dendrochronology

The basis of dendrochronological dating is that trees of the same species, growing at the same time, in similar habitats, produce similar ring-width patterns. These patterns of varying ring-widths are unique to the period of growth. Each tree naturally has its own pattern superimposed on the basic 'signal', resulting from genetic variations in the response to external stimuli, the changing competitive regime between trees, damage, disease, management etc.

In much of Britain the major influence on the growth of a species like oak is, however, the weather conditions experienced from season to season. By taking several contemporaneous samples from a building or other timber structure, it is often possible to cross-match the ring-width patterns, and by averaging the values for the sequences, maximise the common signal between trees. The resulting 'site chronology' may then be compared with existing 'master' or 'reference' chronologies. Pine in Britain may have been imported from several potential localities, although most of the pine that has been successfully dated has come from the southern Baltic Sea area around Poland and to the east of there.

This process can be done by a trained dendrochronologist using plots of the ring-widths and comparing them visually, which also serves as a check on measuring procedures. It is essentially a statistical process, and therefore requires sufficiently long sequences for one to have confidence in the results. There is no defined minimum length of a tree-ring series that can be confidently cross-matched, but as a working hypothesis most dendrochronologists use series longer than at least fifty years.

The dendrochronologist also uses objective statistical comparison techniques, these having the same constraints. The statistical comparison is based on programs by Baillie & Pilcher (1973) and uses the Student's *t*-test. The *t*-test compares the actual difference between two means in relation to the variation in the data, and is an established statistical technique for looking at the significance of matching between two datasets that has been adopted by dendrochronologists. The values of '*t*' which give an acceptable match have been the subject of some debate; originally values above 3.5 being regarded as acceptable (given at least 100 years of overlapping rings) but now 4.0 is often taken as the base value in oak studies. Higher values are usually found with matching pine sequences. It is possible for a random set of numbers to give an apparently acceptable statistical match against a single reference curve — although the visual analysis of plots of the two series usually shows the trained eye the reality of this match. When a series of ring-widths gives strong statistical matches in the same position against a number of independent chronologies the series becomes dated with an extremely high level of confidence.

One can develop long reference chronologies by cross-matching the innermost rings of modern timbers with the outermost rings of older timbers successively back in time, adding data from numerous sites. Data now exist covering many thousands of years and it is, in theory, possible to match a sequence of unknown date to this reference material.

It follows from what has been stated above that the chances of matching a single sequence are not as great as for matching a tree-ring series derived from many individuals, since the process of aggregating individual series will remove variation unique to an individual tree, and reinforce the common signal resulting from widespread influences such as the weather. However, a single sequence can be successfully dated, particularly if it has a long ring sequence.

Growth characteristics vary over space and time, and in order to date imported timbers it is necessary to have access to chronologies from the region where the trees grew.

When interpreting the information derived from the dating exercise it is important to take into account such factors as the presence or absence of sapwood on the sample(s), which indicates the outer margins of the tree. Where no sapwood is present it may not be possible to determine how much wood has been removed, and one can therefore only give a date after which the original tree must have been felled. Where the bark is still present on the timber, the year, and even the time of year of felling can be determined. In the case of incomplete sapwood, one can estimate the number of rings likely to have been on the timber by relating it to populations of living and historical timbers to give a statistically valid range of years within which the tree was felled. Guidance from Cathy Tyers resulting from the English Heritage conifer dendro-chronology project, has provided information gained from European colleagues indicating that the number of sapwood rings in conifers is highly variable between regions and periods and is strongly influenced by the age of the trees. For instance for pine the number of sapwood rings in northern Sweden tends to be over 100, but in the south (i.e. south of Stockholm) it is generally circa 50 ± 30 . In southern Norway it ranges from as few as 20 to over 100 depending on tree age. For example, a 100 year old tree has in the order of 30–70 sapwood rings, whereas a 200 year old tree has in the order of 45–110 sapwood rings. Reliable figures are not yet available for Polish pine, although the Mendlesham chest (Bridge and Miles 2011) had 75 sap rings.

The pine chests at St Nicholas, Ash, Canterbury Heritage Museum and Fordwich Town Hall

Three pine chests were investigated. Only two of these chests found in England have previously been dated, both of them in Mendlesham church, Suffolk (Bridge and Miles 2011). One had an outer measured ring formed in 1417, and with allowances for those lost on the outermost part of the core, was dated to the 1420s, the second was photographed with the latest dated ring being dated to 1388, and was considered likely to be of very similar age.

Sampling

The chests were investigated in May 2012. In this initial study it was decided to attempt to date the three chests by taking digital photographic sequences of the readily accessible boards and analysing these using CooRecorder and CDendro software developed by Lars-Åke Larsson (www.cybis.se). Subsequent analysis was carried out using Dendro for Windows written by Ian Tyers (Tyers 2004). This is a relatively cheap and non-interventional strategy. More information may be gained by micro-boring the boards, but this is a much more interventional process (discussed in Bridge and Miles 2011) and involves specialist equipment. It is a time-consuming process and is relatively much more expensive. It was decided that this was best left until after a photographic survey had been carried out, if it were to be used at all.

Results and discussion

1. FORDWICH

Photographic sequences were taken from all panels (the left and right ends, the front and rear, and the base). The front panel looks as if it may run out to the sapwood, but the outermost rings are very narrow and could not be resolved in the photos.

Front panel: 108 rings (+ at least 50 rings unresolved)

Bottom panel: 156 rings (+ about 10 sap rings unmeasured)

Left panel: 53 rings – no sapwood detected, but could be heartwood/sapwood boundary

Right panel: 77 rings (including 2 sap rings)

Rear panel: 52 rings (plus at least 3 rings unresolved)

Initial cross-matching attempts among this group did not find any strong matches. The series were therefore compared individually with the dated reference material. This produced several possible matches against dated pine from the area of modern Poland:

Left panel outer measured ring 1373

Rear panel outer measured ring 1335

Front panel outer measured ring 1304

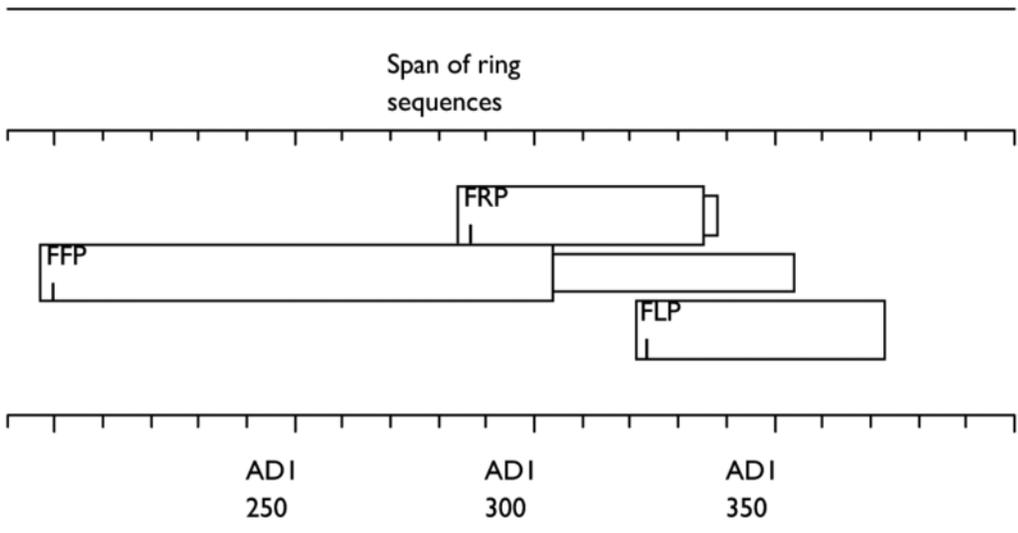
The overlaps between these series, if these positions are indeed correct, are too short to be useful in confirming the possible dating internally (see bar diagram). If one assumes these matches are correct and creates a single representative chronology by meaning together the three series at the indicated positions of overlap, the resulting 177-year chronology gives the following *t*-values against the dated reference material at the position corresponding to the series representing 1197–1373:

PLPINUS (N. Poland) 7.4

KUJAWPOM (Pomerania) 7.1

PISYGDAL (Gdansk and Central Poland 1174–1990) 7.0

Mendlesham Chest 2 3.9



Bar diagram illustrating the relative positions of the ring width series from the various panels of the Fordwich pine chest. The narrow sections of bars represent additional unmeasured rings present.

With the outermost rings and sapwood often being incapable of being resolved from the photographs, this provides a *terminus post quem* of 1374 (since the last measured ring was clearly not the outermost ring of the tree), and an indication that the boards used are likely to have come from a tree felled around the beginning of the fifteenth century, making this chest similar in age to the Mendlesham chests, or possibly a decade or so earlier, though with no measured sapwood and only three boards, this remains speculation. The variation in the apparent end dates of the boards probably represents a lack of resolution of the outer rings from photographs as much as any true variation in date, but with only three boards dated, and none of the measured series including sapwood, it is not sensible to speculate much on this. The panel with the best opportunity for resolving the sapwood issues is the front panel, which appeared to have several sapwood rings, but the outer 6–8cm contained very narrow rings that could not be measured in the present study.

The combined chest chronology gave good *t*-values against the multi-tree, multi-site regional chronologies from Poland. The values are generally higher in matching pine than in oak (as mentioned above), and the fact that the match against the Mendlesham chest is much lower, simply reflects that the Mendlesham chronology probably represents a single tree.

2. ASH

The left and right end panels, the base panel and the front panel were successfully photographed, but the photographs from the rear panel were not sufficiently clear to be measured. Some cross-matching was found between the derived series (e.g., right panel *v* left panel *t* = 6.1 and right panel *v* rear panel *t* = 5.3). A three timber mean of only 68 rings was produced from these three panels, but neither this, nor the 92-year long series from the front panel could be dated against the dated reference material.

3. CANTERBURY HERITAGE MUSEUM

All panels other than the base were photographed. The rear panel photographs were not clear enough to be measured. The series derived from the front, left and right panels were all relatively short – under 60 years long, and did not match each other. The series were not dated against the reference material.

All three chests

The chests had variable numbers of rings and each had at least one panel that looked to have reached the sapwood. The Fordwich series dates against Polish pine series. The photographic series were incapable of resolving the outermost rings – and the more expensive process of extracting micro-cores may be justified in this case to refine the dating of this chest.

Appendix 2

The Kent chests

TABLE AI Till type and lid ironwork among the Kent domed chests

<i>Chest Type</i>	<i>Till box</i>	<i>Number of</i>	<i>Shape of vertical</i>	<i>Number of hinges</i>
<i>Dimensions</i>	<i>Location</i>	<i>vertical (V) and</i>	<i>bands on lid</i>	<i>Widened hinges at</i>
<i>width/height/</i>	<i>Number</i>	<i>horizontal (H)</i>	<i>S all straight</i>	<i>front</i>
<i>depth (cm)</i>	<i>Single or divided</i>	<i>bands on lid</i>	<i>T some stepped</i>	<i>Presence of flange</i>
			<i>W some swelling</i>	
Ash A 134 × 58 × 49	1 Left; divided; lids missing. Chamfered (triple on each side)	11V+10 in between	S	9 hinges Widened hinges Flange
Sandwich A 96 × 50 × 44	Not seen. (Chest is locked)	9V + 8 in between bands, 0H	S	7 hinges Widened hinges Flange
Mereworth B 136 × 61 × 56 Lime lid	1 Left (missing)	11V, 8H	T	9 hinges Flange
Northfleet B 135 × 58 × 54	1 Left (missing)	11V, 7H	W	9 hinges Widened hinges Flange
Canterbury Heritage Museum B 118 × 54 × 54 Lime lid	1 Left divided now missing on evidence of hole where partition pegged. Now contains an oak replacement	9V, 7H	T	7 hinges Widened hinges Flange
Ashford B 108 × 58 × 58	1 Left single undivided	13V, 0H	S	5 hinges Flange
Harbledown C 165 × 67 × 60	1 Left and 1 Right, both divided (unchamfered partition with 3 Xs)	7V, 0H	S	5(?) hinges No flange
Fordwich C 150 × 67 × 56 Lime lid	1 Left; divided; lids missing. Chamfered (triple on each side) On right a shelf with upstand	3V (5 originally probably), 0H	S	3 hinges No flange
Higham C 150 × 65 × 60	2: 1 Left and 1 Right both divided; quadruple chamfered on each side; right hand till with lids; front lid missing from left till	5V, 3H	S	3 hinges Flange
Canterbury St Dunstons C 139 × 60 × 62	1 Left, divided, (single chamfered partition with end notches), one lid present	3V, 0H	S	3 hinges No flange

Ramsgate C 138 × 65 × 52	1 Left, divided, single chamfered partition with end notches, lids missing	7V, 3H	S	7 hinges No flange
Ickham C 133 × 61 × 51 Lime lid	1 Left, divided, lower part of partition but now enclosed in 17th-century locker across whole left end, whose lid occupies space where partition projected above till	5V, oH	S	3 hinges No flange
Faversham C 123 × 55 × 50	1 Left with a second till set back below upper till (both missing)	7V, 3H	W	5 hinges Flange
Minster D 152 × 68 × 69 Lime lid	Not seen (Chest is locked)	2 originally probably plus one hasp strap. Now with 3 later V too, oH	S	2 hinges No flange
Lower Halstow D 136 × 74 × 62 Lime lid	1 left and 1 right, now missing (not divided)	2	S	2 hinges No flange

TABLE A2 Locking arrangements, lock plates, nails and supporting arrangements among the Kent domed chests

	<i>Locking arrangement</i> <i>H Hasp (2H: a hasp with two slots to fit over two staples)</i> <i>K Key flap</i> <i>L Lock flap</i> <i>S Single staple</i>	<i>Lock plate</i>	<i>Nail types (G gabled two faced, R round headed) and presence of roves</i>	<i>Number and type of suspension rings or triangles at each end</i> <i>T large triangle</i> <i>R large twisted ring</i> <i>f small flat ring</i> <i>F large flat ring</i>
Ash	2HLKS2H rod present	Slightly concave sided	Mix of G and R Roves sq/rect several for each fixing	Remains of narrow flat bar in one staple
Sandwich Chest is locked	HLKH (L is replaced) Small chest so no rod?	Concave sided	G and R; lid all G; most G	2T
Mereworth	HSLKSH Assume rod	Slightly concave sided with hasp guard	G and R Roves very small snippets in 3s	missing

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Northfleet	HSLKSH Assume rod	Very slightly concave sided	G and R Roves squarish in 3s	2 bars going to 1F; 2 T at front and back
Ashford	HSLHS rod present	Slightly concave sided (old replacement?)	All G except flange and where repaired Single rectangular roves	2f
Canterbury Heritage Museum	HSLKSH Assume rod	Slightly concave sided; probably later as are lock and key flaps	All G Roves in pairs	2T
Harbledown	HLH	Very large, deeply concave sided and decorated	G and R Inside not seen	2f
Fordwich	HLH	Large deeply concave sided decorated, plus two later rectangular lock plates	R only No roves	1f
Higham	HLH probably	Original missing; Concave sided blank plate	G and R Roves not checked	2f
Canterbury St Dunstons	HLH	Missing	R only Big rectangular roves with rounded corners below only	1f
Ramsgate	SocketHLH rod	Rectangular with decorated U shaped guard	All G Pairs of rectangular roves	1f
Ickham	HSLHS assume rod	Small rectangular probably later	R No roves	One twisted bar attaching to 1R
Faversham	HLH probably	Missing	Mix of G and large R Roves diamond shaped	2T
Minster Chest is locked	Now LLSL but staples belong to earlier hasps or rod locking arrangement Originally L or SLS?	Original missing Now has three later rectangular LPs dating from 1632	R (but not many left) Inside not seen	1f
Lower Halstow	None now; probably one or two L only originally	Probably later rectangular plate Two side by side recesses below it, but no sign of a double lock plate over them	R No roves	1f

Further information on the Kent domed chests

ASH, ST NICHOLAS

Type A (Armoured). Extra-wide hinges. Complex lock with key flap as well as lock flap. Unusual in having preserved its original locking bar together with three out of the original four padlocks ('GR Patent'). Divided till. Remains of pale/ochre coloured paint.

ASHFORD, ST MARY'S

Type B. Quite a short chest. Locking bar (original?) in use. Atypical in that the lid is of pine and the joints between the four walls have apparent mortise and tenon joints at the top though they are pegged too, suggesting the presence of rebated joints. Undivided till. Stained maroon colour. Two holes in lid and new collecting trays inserted. Known as the St Peter's pence chest.

CANTERBURY, HERITAGE MUSEUM

Type B. Similar to the Northfleet and Mereworth chests. Lime lid. Extra-wide front hinges. Stained maroon colour. Used for storing children's games. The Museum has no record of how it was acquired.

CANTERBURY, ST DUNSTANS

Type C. Missing lock and lock plate; the lock shadow is strongly concave-sided. Internal repairs. Divided till at left. Stained maroon colour.

FAVERSHAM, FLEUR DE LYS CENTRE

Type C. Lime lid. Wooden insert where lock was. Damage to lid. Mid-brown colour concealing earlier maroon colour, as at Ramsgate. Belonged to Henry Hatch, a businessman and benefactor of the town who moved there from London. According to his will of 1533 he left 'To the church my chest bound with iron, the which I bought of Henrey Estey of London, to put in the towels and plate of the church'.⁸⁶ Subsequently given to the Fleur de lys Centre.

FORDWICH, TOWN HALL

Type C. Lime lid. Has divided till at left and shelf with upstand at right like the Skrukeby chest. Has later lock plates to the left (modern, holding a staple for a padlock) and right (seventeenth century, with a lock), but large concave sided decorative central lock plate is original. Dark stain applied over original colour. Known as the Muniments chest. Previously contained the town council documents which are now on deposit in Canterbury Cathedral Library.

HARBLEDOWN, ST NICHOLAS

Type C. A very large chest. Very large concave sided decorative lock plate. On the lid the original straps have been removed, new ones added and the old ones replaced on top. Divided tills at left and right. Liquid wax has been applied liberally to the lid. Stained maroon colour on box. Said by Roe to have previously contained the church treasures.

HIGHAM, ST MARY'S (CHURCHES CONSERVATION TRUST)

Type C. Tinning, presumably original, on iron straps. Original lock plate missing and replaced by concave sided blank sheet. Divided tills at left and right. Stained maroon colour, with some orange colour due to preservative treatment.

⁸⁶ Quoted in Johnston (2001), p. 64.

ICKHAM, ST JOHN THE EVANGELIST

Type C. Lime lid. Inside there is a seventeenth-century locker with padlock enclosing the divided till at the left hand side. Later rectangular lock plate. The original large iron rings are now used to fix the chest to concrete bases at each end. Has received preservative treatment giving it an orange-brown colour. According to Mee 'there is an old chest given by a sheriff of London who lived here in 1394',⁸⁷ but I have not found the records on which this statement is based. The date seems perfectly plausible.

LOWER HALSTOW, ST MARGARET OF ANTIOCH

Type D. Lime lid, now split. Random circular punchwork decoration on end of the lid (original?).

MEREWORTH, ST LAWRENCE

Type B. The chest is an unexpected find in what Pevsner describes as the best eighteenth-century church in Kent, built to improve the view from the castle, which involved demolishing an existing church. The chest may have come from either castle or church. Lime lid. Complex locking arrangement with key flap as well as lock flap. Stained maroon colour. Now contains Christmas decorations.

MINSTER, ST MARY THE VIRGIN

Type D. Lime lid. Locked. The Churchwardens accounts for 1632 record 'for 3 lockes ye chest 10s od' (church guidebook, p. 35). There is now no sign of the original lock and some metalwork is missing. Generally the chest is in poor shape. The box has been scrubbed, removing any colour. Referred to locally as the Muniment chest; previously used to store the parish records.

NORTHFLEET, ST BOTOLPH'S

Type B. In good condition. At one end the large suspension rings have attaching bars. Additional pair of suspension triangles at front and back. Stained maroon colour. Used to store flags.

RAMSGATE, ST LAURENCE THE MARTYR

Type B. Divided till at left. An unusual chest in several respects. The lid is composed of three parts; additional full length boards have been added to thicken it; they are held on by inset horizontal bands which pass under the vertical straps to wrap round and fasten underneath the ends of the lid. The front is made of two boards, the only example of this I found. The lock plate is rectangular with a U-shaped hasp guard and concealed slider and the hasp has a segmented design. It previously had a locking bar which slid into a protective casing at the left. Yellow-brown colour; obviously a later finish as where it has flaked off on the end grain of the lid a bright dark red colour is visible. Later(?) trestle feet. Inside is a vertical bottle rack with no signs of recent use. Described in the church guide as 'supposedly an offertory coffer in which Peter's pence (a tax paid to the Holy See) was collected'.

SANDWICH, ST MARY'S (CHURCHES CONSERVATION TRUST)

Type A. A short chest. Complex lock with (replaced) key flap as well as lock flap. Locked to a column of the church and the key could not be found.

⁸⁷ Mee (1947), p. 256.

Appendix 3

Chests and coffers in the Hull customs records

One of the problems of making sense of the evidence on imported chests is the uncertain meaning of the terms used. It is worth exploiting the data in the Hull customs records for what they can tell us about the usage of the terms chest and coffer, terms often found in inventories and wills, which have given particular trouble to furniture historians. This is partly because different terms were in use in different parts of the country. For example, Janet Sleep has shown that the word coffer was in use in parts of Suffolk and Norfolk in the late seventeenth century whereas it had disappeared in Steyning, Sussex by 1560.⁸⁸

In the present study we are dealing with an earlier period. The Hull customs records for 1453–1490, as published by Childs, provide a useful source because they record the port of origin of the boat as well as details of the cargo on which duties and taxes were paid. They are written in a mixture of English and Latin. They reveal 35 boats arriving from Danzig, out of a total of some 900. However, records are missing for 1454–09 (apart from one boat) and 1473–83, so the 35 boats over 21 recorded years represent less than two per year. The typical cargos arriving on these boats were on the one hand raw materials such as timber (bow staves, wainscot, *clapholt*), flax, fur and skins, wax, iron and bitumen, eels, and sturgeon, and on the other wooden manufactured items, such as trenchers, chests, counters, lecterns and the occasional playing table, clavichord or lute.

The Hull records have the advantage of distinguishing between chests and coffers. (It would be interesting to know whether this distinction was used generally in ports at this time, or whether it was associated with east coast ports.) Of the 35 boats, 19 did not bring any chests or coffers, which suggests that other forms of container existed. The 16 boats which did, brought a total of 140 chests, 17 ‘nests’ of chests, 25 coffers and 208 ‘nests’ of coffers. The meaning of nests is uncertain, but is usually considered to be a small set, e.g. three.⁸⁹ If this figure is adopted the total numbers of chests and coffers imported to Hull are 191 and 646, i.e., an average of nine and 31 per recorded year.

To obtain an estimate of the total number of coffers imported from Gdansk per year, it is necessary to estimate Hull’s share of the national total of Gdansk trade. If this is taken as within the range 3.7% to 7.3%,⁹⁰ the figure of 31 has to be multiplied to give a total number of between 425 and 838 imported coffers from Gdansk per year, ignoring any that arrived indirectly via other ports such as Bruges.

The Hull records of chests and coffers do not include any additional description referring to their shape or timber type. This is frustrating, but customs records were records of duties to be paid rather than being written with the needs of historians in mind. Moreover, the customs duties payable are stated for the whole cargo of each merchant on a given boat, preventing one from valuing chest and coffers individually. However, the records do contain valuable information. Firstly, in support of Tracy’s argument that chests were like containers, the records

⁸⁸ Sleep (2004); Chinnery (1979), pp. 351–63

⁸⁹ Childs (1986), p. 255. However, whether it also meant that they were ‘sitting inside one another’, as she suggests, is debatable. Domed chests could not have done so due to their lids, their till boxes and their similar dimensions. Friel describes ‘dunnage’, a soft material such as straw, used to protect tuns of wine in the holds of ships. If some dome chests were exported as separate lids and boxes could they have been wrapped together in protective ‘nests’? [Friel (1995), p.136].

⁹⁰ Figures for 1478–82 given by Kowalski (2000), p. 477, show that Hull and its subsidiary ports had 4.4% of the total value of overseas trade. Since ports to the south and west of Sandwich (which totalled 20.4% of overseas trade) are likely to have had little Gdansk trade Hull’s share can be raised to 5.5%. Due to the uncertainties of such calculations, e.g. accuracy, typicality of the year chosen, differences in calculation based on number and value, a range of +30% to -30% is considered advisable, i.e. 3.7% to 7.3%.

of the chests often refer to the contents: most often bundles of flax ('*1 cista cum 18 bund' lini*', but also trenchers ('*1 cista cum 6 scok [360] trenchoures*') In contrast, references to coffers never refer to their contents.⁹¹ This is most likely to mean that they were empty and were being imported as coffers. Secondly, the fact that references to nests of chests were rare whereas most coffer references were to nests of coffers supports the idea that chests were larger than coffers and were more likely to be used as containers for other objects. It is reasonable to assume that these coffers included the domed pine chests of interest here.

The above figures are estimates for the second half of the fifteenth century. We cannot know whether the rate of import of coffers from Danzig was greater in the first half of the fifteenth century, although timber imports were higher then. There could have been a switch from exporting timber to exporting manufactured wooden products.

It is reasonable to assume that the terms used by customs officials were ones which had local currency. There is thus scope for further study of customs records to throw light on local usages as well as on the source and nature of imported chests and coffers. At the same time, regional variations in usage mean that conclusions from one port cannot be applied generally.

Appendix 4

*List of 130 extant domed chests at July 2012*⁹²

Bedfordshire 1: Dunstable

Cambridgeshire 14: Cambridge – St Botolph's, Christ's College (2), Clare College, King's College, Queens College, Sidney Sussex College, St John's College, University Registry; Diddington, Hilton, Kingston, Meldreth, St Neots (museum).

Durham 2: Durham Castle, Durham Cathedral.

Essex 8: Brightlingsea, Calvering, Great Leighs, Great Tey, Little Bentley, Pentlow, Stebbing, Ugley.

Gloucestershire 3: Cirencester, Frampton Cottrell, Michelton,

Hampshire 1: North Baddesley

Herefordshire 1: Hereford Cathedral

Hertfordshire 5: Baldock, Cheshunt, King's Langley, Little Gaddesdon, Watton at Stone

Kent 15: Ash-next-Sandwich, Ashford, Canterbury Heritage Museum, Canterbury St Dunstan's, Faversham (Fleur de lys Centre), Fordwich (Town Hall), Harbledown, Higham, Ickham, Lower Halstow, Mereworth, Minster-in-Thanel, Northfleet, Ramsgate (St Laurence), Sandwich (St Mary's).

Leicestershire 2: Leicester Guildhall, Oakham.

Lincolnshire 6: Barton-upon-Humber, Epworth, Lincoln (museum) (2), Quadring, Stamford.

London 2: V&A, Westminster Abbey (now at National Archives, Kew).

Norfolk 16: Banham, Bressingham, Cawston, Downham Market (St. Edmund's), Erpingham, Fincham, King's Lynn, Ludham, Martham, Norwich (museum), Paston, Saxlingham, Sharrington, Shipdham, South Creake, Thompson.

Northamptonshire 3: Braunston, Northampton (St Sepulchre), Rockingham Castle.

Nottinghamshire 4: Clifton, Newark (museum) (3).

Oxfordshire 5: Burford (museum), Oxford Magdalen College (3), Ashmolean Museum.

⁹¹ Childs (1986), p. 194; Sherlock (2008), p. 11.

⁹² This list is based on the list drawn up by Gavin Simpson in his 2008 article, and reproduced with his kind permission, to which have been added the chests which he and others have found since it was published. In the case of locked, armoured chests the pine of the box remains to be confirmed. Unless otherwise stated, the chests are in the parish church.

Somerset 1: Selsworthy.

Suffolk 29: Beccles, Blaxhall, Boxford, Chelsworth, East Bergholt, Finningham, Framlingham, Glemsford, Gorleston, Groton, Hadleigh (2), Little Cornard, Little Waldingfield, Long Melford (Holy Trinity Hospital), Martlesham, Mellis, Mendlesham (2), Nayland, Pakenham, South Elmham St. Cross, South Elmham St James, Thornham Parva, Walberswick, Walsham-le-Willows, Wattisfield, Westhorpe, Wyvestone.

Sussex, East 2: Warbleton, West Tarring.

Sussex, West 1: West Lavington.

Warwickshire 1: Ilmington.

Wiltshire 3: Coombe Bissett, Salisbury Museum, Steeple Ashton.

Worcester 1: Worcester (St Swithin's).

Yorkshire, East 2: Howden, Lockington (Browne's Hospital).

Yorkshire, North 2: Whitby, Whixley.