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Short articles



The Horseman Cometh

AN 11TH- OR 12TH-CENTURY SCABBARD CHAPE FROM CLAPHAM, WEST SUSSEX

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INTRODUCTION

A metal detectorist searching a cultivated field near Clapham, West Sussex, in April 2016, discovered a highly significant scabbard chape of 11th or 12th century date (Fig.1). The detectorist reported his find to the author, allowing high-quality images and measurements to be taken, as well as providing an accurate findspot. From these, a full Portable Antiquities Scheme (PAS) record was created (*see* www.finds.org.uk, ID PUBLIC-3888AD). This article will discuss the typology and art historical context of the Clapham find, drawing attention to other similar chapes recorded on the PAS database and elsewhere, before making some more general observations on the function and distribution of this class of metal artefact.

CHRONOLOGICAL CONTEXT AND BACKGROUND

Anglo-Norman chapes like the Clapham find are rare within England and Wales, with only around 30 of this general type recorded on the PAS database (*see* Appendix). It is rare to see these objects survive in good condition; most are heavily broken or fragmentary (Fig. 2). The well-preserved nature of the example from Clapham, along with the scarcity of

these artefacts in general, marks it out as a find of national importance and of substantial interest within its local region. Relatively little focused study has been undertaken on these objects, with discussion limited to a series of short articles in *The Searcher* and *Treasure Hunting* by Peter Woods and Michael Lewis respectively. Some additional analyses are available in a paper by Steve Ashley (2016), an MA dissertation by Ben Bishop (2015) at the University of Reading, and Brian Spencer's publication on the uniquely non-detected example acquired by the Museum of London in the early 1960s (Spencer 1961). Woods (2006) has set out a broad typology for these pieces and it is this classification system that is used to divide chapes of this broad date into a variety of different forms, with the Clapham piece corresponding to Woods type V.

CONSTRUCTION

The chape is formed of a single piece of cast metal, folded over into a 'U' shape to form two sub-rectangular openwork plates, with a vertical projecting arm extending from one edge that has mostly broken away. Originally, the terminal of this arm would have possessed a circular-sectioned copper alloy rivet, although



Fig. 1. The Clapham chape.

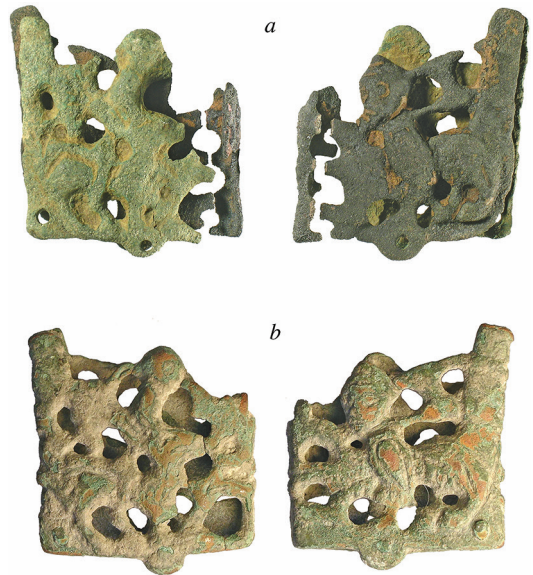


Fig. 2. Two similar chapes recorded on the PAS database: (a) BH-71DB92 (length; 38.2mm, width; 33.2mm), Hertfordshire; (b) SUSS-03FD90 (length; 36.33mm, width; 34.32mm), West Sussex (St Albans District Council, Sussex Archaeological Society and the Portable Antiquities Scheme).

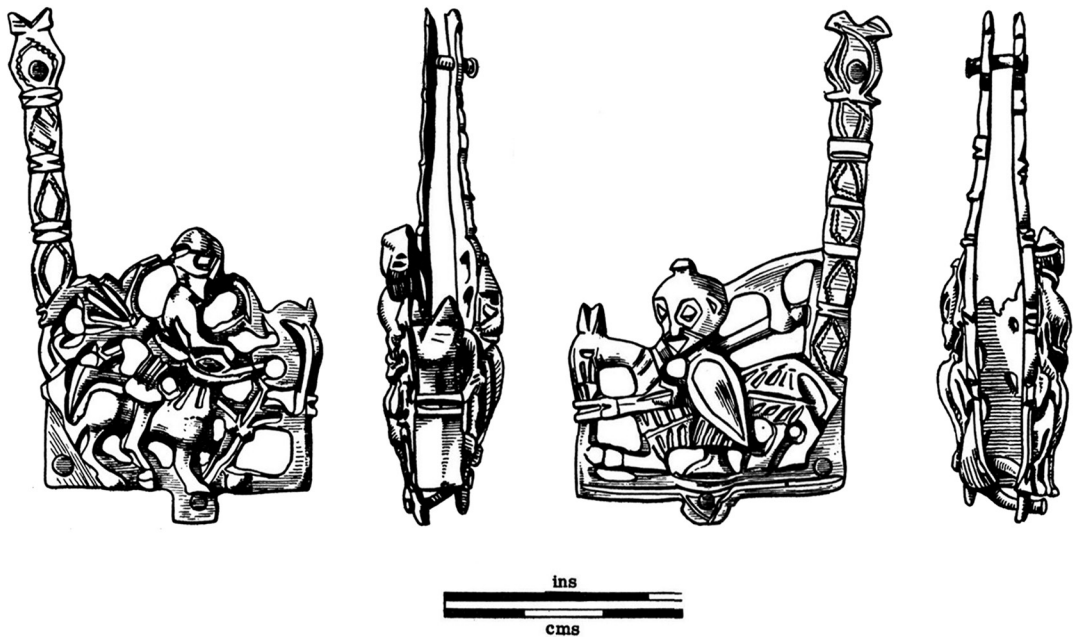


Fig. 3. The illustrated chape from Angel Court, London, now in the collections of the Museum of London (reproduced by kind permission of London and Middlesex Archaeological Society).

now only the rivet in the lower back edge of the chape survives while that at the midpoint of the object has mostly corroded away. The survival of this distinctive projection is rare in the corpus of known examples, with only SUR-A69854 on the PAS database retaining most of this component. However, the chape excavated at Angel Court, London, in the early 20th century (Fig. 3) survives complete, and serves to illustrate the original full form of these objects.

DECORATION, INTERPRETATION AND RELATIONSHIP WITH OTHER CONTEMPORARY METAL ARTEFACTS

The two plates of the chape depict two different subjects. Their interpretation can be difficult to ascertain due to the highly-stylised nature of the decoration (see Fig. 4), a feature of this type of object which became steadily more degraded and abstract over time (Woods 2006, 26–9). On one side, a helmeted rider with crudely incised facial features is visible astride a horse. He holds a battle-axe over his right shoulder and a kite-shaped shield in his left hand, which serves to cover most of his body. On the reverse face of the object a second individual is visible, apparently grappling with an animal against a foliate background. Both are rendered in a markedly different style to the first plate. It is uncertain what species of animal is intended, although fox, deer and lion have all been suggested (Ashley 2016, 293).

Both the armed horseman and the stylised beast with human figure are notable in that they occur on all recorded examples of this type of object, with only minor stylistic variations occurring between them (see Figs 1–3). The

significance of this iconography is unknown, although Lewis (2012, 77) notes that the horseman bears some resemblance to depictions on the Bayeux Tapestry, embroidered in around 1070, in particular the appearance of his shield. The grappling figure is rather more difficult to interpret, although Ashley suggests it may represent a biblical character such as David or Samson, or even the mythological Hercules (Ashley 2016, 293).

Iconography notwithstanding, the intricacy of the decoration on pieces of this type, and their relative technical sophistication, suggest they were high-status objects, a point

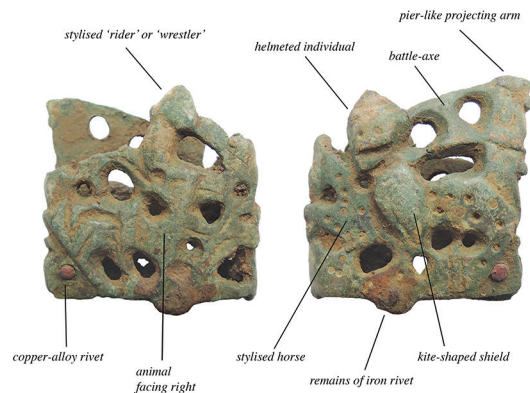


Fig. 4. Distinct decorative elements on the Clapham chape (length; 31.48mm, width; 31.6mm).

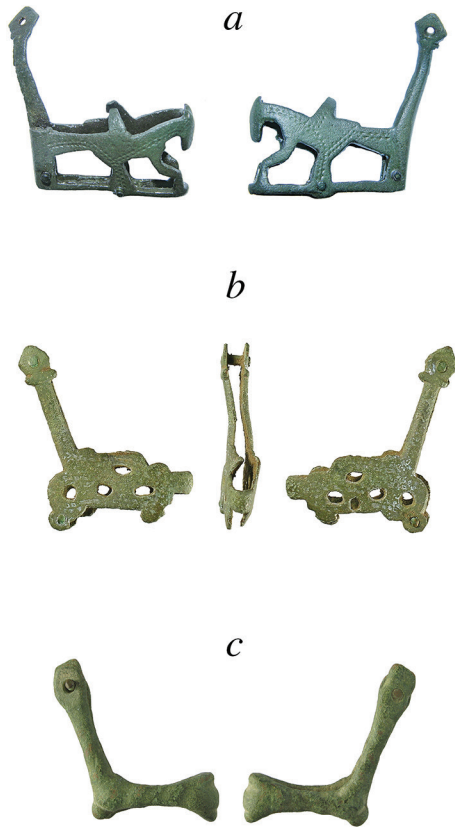


Fig. 5. Anglo-Norman chape types recorded on the PAS database: (a) LIN-E5C477 (length; 32.5mm, width; 31mm), Lincolnshire; (b) BH-1344E7 (length; 36.2mm, width; 28.9mm), Central Bedfordshire; (c) HAMP-7B9723 (length; 26.55, width; 27.55mm), Hampshire (Lincolnshire County Council, St Albans District Council, Winchester Museum Service and the Portable Antiquities Scheme).

perhaps further supported by their scarcity. Within the corpus of Romanesque metalwork known from Britain, these objects are highly unusual. They are clearly related to a series of similar, yet far less intricate, chapes of similar construction (Fig. 5) that are frequently zoomorphic in nature, although to varying extents. Similarities can also be seen between these objects and the small corpus of Romanesque-style buckle plates (Fig. 6) known from Britain, most of which have also been recorded and brought to light through the Portable Antiquities Scheme. These, in addition to displaying ornate, zoomorphic motifs, also frequently employ openwork decoration in a manner very similar to that on Woods type V chapes.

FUNCTION

There has been considerable debate over the function of these objects during the last 50–60 years. Writing in the context of the Angel Court chape in the early 1960s, Spencer suggested

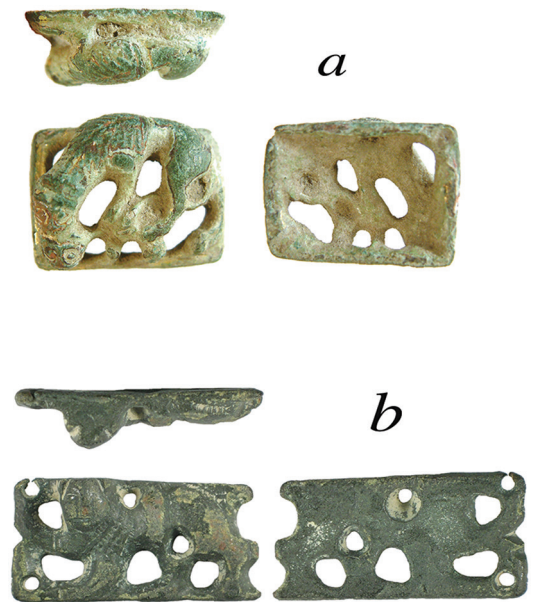


Fig. 6. Romanesque-style openwork buckle plates of the late 11th–12th recorded on the PAS database: (a) WILT-1C29E7 (length; 24.73mm, width; 18.03mm), Wiltshire; (b) SUSS-FB8914 (length; 28.5mm, width; 14.4mm), East Sussex (Salisbury and South Wiltshire Museum, Sussex Archaeological Society and the Portable Antiquities Scheme).

that they were designed to be seen in the round and that their asymmetrical form, with only one projecting arm, identified them as attaching to the edges of combs or comb cases (Spencer 1961, 214). Woods (2006) has stated that these objects could also be belt fittings, although this view has somewhat fallen from fashion. The current consensus suggests that they are scabbard chapes for knives or daggers, which might explain the martial or militaristic elements depicted on them. The mounted individuals, battle-axes, conical helmets, lances and kite-shaped shields conform with Norman military style, which fits well with the suggested date for these objects (around AD 1050–1200), alongside Lewis' comparisons with the Bayeux tapestry.

DISTRIBUTION

Using PAS records and additionally incorporating published Norfolk HER data (Ashley 2016, 293), accurate as of December 2016, to formulate a broad spatial distribution of these objects, type V chapes have been recorded from Norfolk (8), Suffolk (5), Oxfordshire (5), Sussex (4), Kent (2), Essex (2), Hertfordshire (2), Wiltshire (2), Bedford (1), Buckinghamshire (1), London (1), and the Isle of Wight (1). Including Spencer's example from Angel Court and a fragmentary plate from Oxfordshire, currently pending PAS recording, it can be seen that the core distribution of these objects is in East Anglia, with fairly significant numbers also occurring in Sussex and Oxfordshire and a few outliers spreading into the southwest.

CONCLUSION

In summary, the Clapham chape is one of the finest and best preserved of its type to have been recovered, both from Sussex and England as a whole. The corpus for finds of this type is relatively small, thus it forms a welcome addition to this distinctive expression of Romanesque metalwork. Aside from highlighting its significance, this short article has also sought to emphasise the importance of the Portable Antiquities Scheme and how a responsible attitude towards metal detecting, coupled with the active recording of archaeologically decontextualised plough-soil finds, can provide a great deal of information about less common object types rarely encountered during archaeological excavation. The more of these artefacts that are found, recorded and actively studied, the more we can understand the nuances of their form, style and distribution and their relationship to both the material worlds they occupied and the people who interacted with them.

ACKNOWLEDGEMENTS

My thanks go to Robert Webley, whose advice on appropriate sources and vocabulary, both in constructing the PAS record for the chape and writing this article, was instrumental in achieving its subsequent publication.

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APPENDIX

'Horse and rider' chapes recorded on the PAS database, categorised by geographic location.

NORFOLK
HER 29913
HER40986
HER 41710
NMS-3D78D4
NMS-33DEC5
NMS-782092
NMS-609375
NMS-0CEF07

SUFFOLK
SF-590C47
SF-443F75
SF-C0D314
SF-CB7ED2
BH-9C3582

SUSSEX
SUSS-E3AFD4
SUSS-6E6496
PUBLIC-3888AD
SUSS-03FD90

OXFORDHIRE

BERK-24BCA3
BH-9406A5
BERK-2C6116
BERK-3228B7

HERTFORDSHIRE

BH-96B701
BH-71DB92

ESSEX

HAMP-33E2D6
HESH-81C32B

KENT

KENT-55D3F6
KENT-E58A82

WILTSHIRE

HAMP-702A22
WILT-5F15C3

HAMPSHIRE

SUR-A69854

ISLE OF WIGHT

IOW-3000E8

BUCKINGHAMSHIRE

WILT-7CB795

BEDFORD

BH-99527B

Excavations on a medieval farmstead at Patchway Field, Stanmer, near Brighton



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INTRODUCTION

The aim of this article is to bring together the meagre records from the investigations at Patchway Field, Stanmer, and produce some record of the excavations, even if it is less than ideal. The archive is sparse, with only a few notes on context sheets and some very basic plans and section drawings.

The written record is derived mainly from the annual reports of the Brighton and Hove Archaeological Society, although there are brief notes about the excavations in a Stanmer publication, *Hovel in the Wood* (Yeates 1980). In chapter three, entitled 'They helped shape the landscape', Charlie Yeates writes:

The important earthwork down the southern slope at Patchway Field. It is here that we believe the little Saxon community founded their settlement. The long, narrow, fertile valley running away from the earthwork, nestling in the shelter of the coombe head would be the logical area for their farming activities. We have never discovered actual evidence of their occupation here in Patchway Field, but certainly in medieval times, a little farmstead appears to have flourished there, because we carried out many a season's work, gathering large quantities of medieval pottery, an iron military arrow head, a riding spur and cutting shears, all of medieval origin. Then there is a record dated 1279 in which it states that Maude de Kymere relinquished to the Priors of Lewes all her rights in the tenement called Pachelswye. We are confident that this refers to the earth work area in Patchway field.

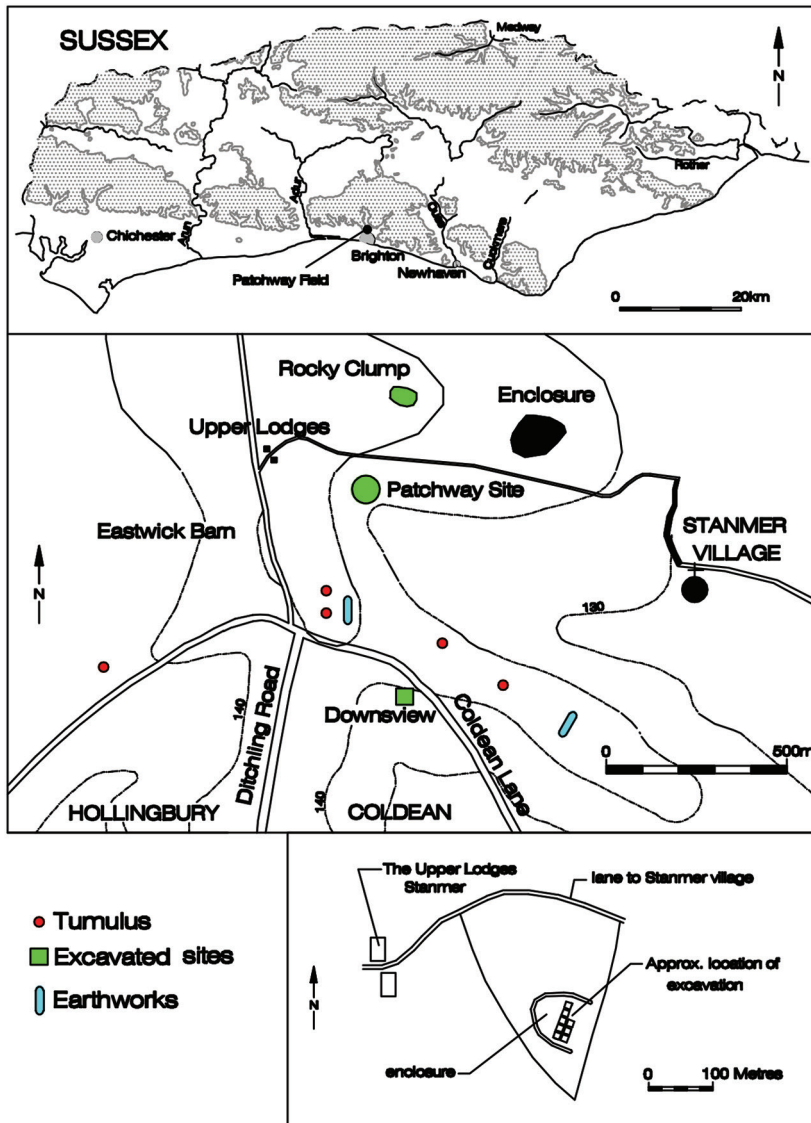


Fig. 1. Location map and excavated sites in Stanmer (the A27 Brighton bypass omitted for clarity).

The little Saxon community referred to is believed to be the seven burials found within the trees at Rocky Clump (Gilkes 1997), although no burial goods were ever found and the dating is based purely on the orientation of the interments.

Patchway is a small field at the end of a valley, about one kilometre west of the village of Stanmer (TQ32650885) (Fig. 1.) The field contains a series of earthworks forming an enclosure, almost circular in configuration, but with an open end on the east side. BHAS conducted several small-scale excavations within and around the enclosure between 1958 and 1971. The only records of these investigations are in some BHAS annual reports and the small archive of notes and drawings.

HISTORICAL CONTEXT

One interpretation of the name could be derived from the Old English *Pettelswige*, or *Paeccasweoh* with the *weoh*, or shrine, belonging to an individual named *Paecel* (Stenton 1971). Excavations at Rocky Clump, a short distance away in a field to the north of this site, have provided some evidence for Roman and later activities, possibly associated with the place name. Substantial post-holes at Rocky Clump may be the location of some form of Roman house, barn, or, as the excavator suggested, a possible Roman shrine (Gorton 1988).

THE EXCAVATIONS

The first tentative steps were taken in 1958 when members of the BHAS Stanmer Group, including boys from Varndean School, made two interventions into the horseshoe-shaped enclosure. No directions or locations are given for these trenches, but they did produce enough archaeological finds to justify return visits to Patchway. The excavations were very much a family event, with children often part of the digging team (Fig. 2).

In 1960, flints with some mortar were found, suggesting a collapsed wall. The excavations produced no roofing tiles, but some small nails found during that season tend to suggest that any building would have had either a shingle or a thatched roof. It is possible that the nails were associated with rafters or other structural woodwork. There was only a slight scattering of pottery, possibly indicating that it was an outbuilding. A second trench was cut to a depth of 1.67m, revealing deep colluvial deposits. It consisted of several layers, with flints between each layer. The top layer produced medieval pottery, while the bottom one produced Roman pottery and a bronze fibula similar to one found at Angmering (Scott 1938, 34; No 1).

Further excavations in 1965 revealed the possible site of a 13th-century farmstead. The features here appear to be more substantial, but still seem to be of only one structure. Among the finds were an iron arrowhead and some green glazed wares. One area produced several medieval tiles and part of a quern.



Fig. 2. General shot of the excavations.

The 1970 season revealed part of a tiled floor and several unconnected areas of flint and mortar. Some flints were mortared together, but no semblance of a house or building plan was revealed. Finds included horse or ox shoes, a gilded buckle, bronze straps, a prick-spur and animal bones.

The final season of excavations in 1971 revealed no definite outlines for a building, only a spread of chalk over a darker loam fill. The excavators recorded that there were many unmortared flints. However, some flints did have mortar traces and it was suggested that the structure was an open-sided cart lodge.

THE FINDS

A search of their stores by members of the Stanmer Preservation Society produced few surviving finds from the excavation.

THE POTTERY by K. Barton

Unfortunately, the pottery recovered from the Stanmer Museum store consisted of only seven rim sherds, all from different pots. This is only six percent of the total collection mentioned in the pottery report by K. Barton (Table 1). It is uncertain where the missing pieces have gone and it is assumed that they are lost.

Barton concluded that the site was very short lived. The incidence of unglazed and partially glazed jugs, together with both coarse and finer redwares and only a few glazed wares, suggests a date of the early 14th century.

THE METALWORK

The iron metalwork included a barbed arrowhead, a prick-spur, a pair of shears measuring 254mm in length, a Roman Dolphin type fibula (Scott 1938) of the late 1st or early 2nd century (now lost), one complete horseshoe and fragments of two horseshoes.

DISCUSSION

The small valley at Patchway has deep colluvial deposits and these have revealed a Roman presence in the lower levels comprising a few sherds of pottery and a Roman fibula. It is possible that these were washed down from the nearby

Table 1. Basic pottery quantification (No. of sherds).

Romano-British/Iron Age	4
Medieval: Red sandy wares	79
Other coarse wares	5
Partial or unglazed wares	4
West Sussex wares	14
Other glazed jugs	4
Paint under glazed jugs	1
Post-medieval Tudor C16th glazed	1
Other C17th	4
Modern	4
Total	120



Romano-British site at Rocky Clump. Finds at Patchway Field and Rocky Clump have included items from both the Romano-British and medieval periods (Gilkes 1997).

The small collection of finds from Patchway Field tends to suggest that a small medieval farmstead may have been located within, and around, the confines of a banked enclosure. However, the finds appear to be more orientated towards hunting, and the lack of any bone assemblage or other domestic debris raises the possibility that the enclosure had other uses. The sketchy plans and section drawings show a number of features, including possible walls and floors of both flint and chalk. A small, tiled area could be the location of a central hearth, but these simple drawings lack any clear definition of actual structures. There are few examples of medieval low-status or peasant dwellings still surviving or recorded. The medieval settlement at Hangleton had several low-status structures (Holden 1963), and excavations at Muddleswood (Butler 1994) and Bramble Bottom, Eastbourne (Musson 1955), show that very little survives of houses that were timber framed, with wattle and daub walls.

A horseshoe-shaped enclosure is still visible in the valley bottom at Patchway. Further investigations, including geophysics, may prove worthwhile to establish whether any buildings, medieval or Roman, are still hidden in Patchway Field.

ACKNOWLEDGEMENTS

The author would like to thank the family of the late Ken Goodchild for allowing access to the paper archive, Brighton and Hove City Council for allowing access to the land, and the Stanmer Preservation Society for loaning the surviving finds. His thanks also go to those members of BHAS who assisted with the excavations, and to Mark Gillingham for proof reading and editing this report.

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The medieval chest at St Mary's church, Horsham: an important unrecorded pin-hinged, clamped chest

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Medieval chests are the main surviving form of medieval furniture and are mostly found in churches. Surveys have been published by Roe (1902), Johnston (1907) and Eames (1977) and there have been numerous specialised studies (Lewer and Wall 1913, Sherlock 2008, Pickvance 2012, 2014, 2016, 2017). The starting point for this article is the survey by Johnston who distinguished three types of medieval chest: dug-out, boarded and clamped. These differ considerably in quality. Whereas boarded chests are held together with nails and iron strap-work, clamped chests use mortice and tenon joints: the four walls are made of boards with wide tenons which are pegged into long mortices in the stiles (uprights).

Johnston drew attention to a group of clamped chests in Sussex with pin hinges, in which the lid has a batten or cleat attached under each side with a hole through the rear end, allowing it to rotate on an iron rod fixed across a rebate in the rear stile. The chests at Chichester Cathedral Treasury (from Climping, Felpham and the Cathedral itself), Midhurst, South Bersted and Stedham have large chip-carved roundels on the façade with whorls and geometric designs; the Buxted chest has small flower-head and star roundels. Those at Bosham and Rogate lack roundels. Johnston also recorded similar chests outside Sussex. Whether the examples in Sussex are distinctive will emerge from my current research on the whole set. At St Mary's Horsham Johnston recorded a 1.11m wide '13th century' boarded chest without ironwork (in my view 16th century) but on a recent visit I was surprised to find also an imposing chest of the pin-hinged, clamped type (Fig. 1). The aim of this article is to draw attention to the quality of this chest and compare it with others in Sussex.

The Horsham chest is the most capacious of the Sussex group; it is of oak, 1.80m wide × 0.96m high × 0.70m deep. It stands high as, unusually, the stiles have not been shortened. The Bosham, Climping, Midhurst and South Bersted chests are of similar length but only the Bosham chest is similar in depth. The lid is a replacement, but the stop-chamfered left-hand cleat is original. The left-hand pin hinge has its original protective iron plate covering the iron rod. The chest has never had the applied grid of rails and muntins found on many of the group which strengthens the joints between sides and stiles. The sides of the chest are vertical, which is atypical of the Sussex group where they are inward-sloping. The later bottom of the chest is formed by front-to-back boards which are held in grooves in the four walls, which thicken at the bottom. The chest is largely free of furniture beetle infestation. Inside the chest there is a large 'till-box' for small items, with a later lid and lock. It has a concealed lower section with a flat bottom which is accessed by pressing down the bottom of the upper box which then tilts open. Many of the Sussex chests have concealed lower till-boxes



Fig. 1. Horsham chest, façade.



Fig. 2 Chichester Cathedral chest, façade.



Fig. 3. Chichester Cathedral chest showing roundel with polychrome and iron nail head, and carving on foot.

but all are tapered in cross-section; and access is by removing a peg covered by a muntin in the applied grid.

The front of the chest is plain apart from a bold, triple-moulded relief 'frame' formed by removing wood from the surface. All over the front are vertical marks made by a paring tool. The Chichester Cathedral chest also has a frame but it is made of simple incised lines in the surface (Fig. 2). The Horsham chest is likely to have been painted originally but has been thoroughly scrubbed; the Chichester Cathedral chest has polychrome in its roundels (Fig. 3). The Horsham chest's most striking feature is the elaborate 'column/lunette' carving on the feet of the front stiles (Eames 1977, 139) (Fig. 4). The lunettes have a gothic point, like the arcading on the Climping and Buxted chests, whereas the semi-circular shape is more usual, and the bosses have been carved with six-foils and whorls rather than being left plain. The feet also have separate, small, six-pointed star roundels. Unusually, the rear stiles have column-shaped inner edges. The Chichester Cathedral and Buxted chests also have surface carved feet, as did the Climping chest formerly (Johnston 1907) (see Fig. 3). The Rogate chest has openwork column/lunettes, as do the Godalming and Long and Large chests at Westminster Abbey and the style is found throughout western Europe (Charles and Veuille 2012, Miles and Bridge 2008, von Stülpnagel 2000).

The façade has three of the original four iron discs on either side of a central lozenge-shaped escutcheon. These are characteristic features of this group of chests and also survive at South Bersted and Bosham but generally they have disappeared. The discs either cover nail or bolt heads or are purely decorative.



Fig. 4. Horsham chest, carving on foot.

Behind the façade a long wooden cover is fixed which conceals the original sliding bolt lock which was actuated by a central key (Fig. 5). The Buxted and Bosham chests are the only other Sussex chests to preserve this wooden cover but all chests of the group, and their East Kent equivalents, had the same type of bolt, contrary to the idea that chests in churches always had three locks (Pickvance 2016). The lid held staples (four here) which fit into recesses in the wooden cover when the lid is closed, and are then engaged by the sliding bolt. Three staples survive at Stedham (Fig. 6) and holes where they were once fixed can be seen on the other chests with original lids. The columns of nail heads cover wooden pegs and are both decorative and protective. The Chichester Cathedral chest has iron discs at the centre of the three roundels (see Fig. 3) and other decorative iron discs or nail heads can be seen in Germany and Switzerland. There are signs of later hasps and staples for padlocks.

The fact that Johnston did not record the Horsham chest when he visited the church raises the question of whether it was temporarily absent in 1907 or arrived later. Chests in churches may have been bought or made for the church, or,



Fig. 5. Horsham chest, wooden lock cover.



Fig. 6. Stedham chest, staples fixed to lid.

more often, be gifts or bequests. They may also be moved out of the church. Unfortunately, documentary evidence on chests is usually more concerned with their valuable contents (legal documents, altar cloths, vestments, church plate, etc.) than with the chest itself.

Johnston dated the Bosham, Chichester Cathedral, Rogate and South Bersted chests (all with lunettes and/or roundels, considered romanesque features), based on stylistic analysis, to 1200–1220 and the Climping and Buxted chests (both with gothic arcading and roundels) to 1230 and 1260. However,

Eames (1977, 139, 143–5) suggested dates of 1282–1300 and 1300–1350 for the Climping and Chichester Cathedral chests and other writers have argued that styles of carving on medieval chests can lag considerably behind architectural styles, e.g. by 50 to 100 years (Roe 1902, 36–40). The latter view has been supported by the dendro-dating of medieval chests in recent years (Bridge and Miles 2011), for example, the Graveney, Kent chest (with gothic arcading), dated by Johnston to 1200–1220 has been dendro-dated to 1258–1290 (Pickvance 2016) and the Deep Chest at Westminster Abbey (plain, with iron discs and a round escutcheon for a sliding bolt lock) to 1274–1290 (Miles and Bridge 2008). So far dendrochronology has not been applied to any Sussex chest.

In sum the Horsham chest is an important addition to the corpus of pin-hinged, clamped chests. It is a high-quality product and is distinctive within the Sussex group, and has several features which rarely survive. It is likely to date to between 1250 and 1350 but only dendrochronology can establish a narrower date range.

ACKNOWLEDGEMENTS

I would like to thank Jane Gorrie (St Mary's, Horsham), Michael Moriarty (Chichester Cathedral) and Matthew Payne (Westminster Abbey) for access to the chests, and Martin Bridge, Joe Thompson and David Sherlock for their advice.

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Charles Dawson's anti-Zeppelin bullet

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Charles Dawson (1864–1916) has his place in history assured by finding the remains of Piltdown Man and publishing them in 1912 with A. S. Woodward as a new type of early human, a 'missing link' in human evolution and more ancient than any fossil human yet found in Europe. Ever since Piltdown Man was exposed in 1953 as a hoax, he has been heavily implicated in their fabrication. Any evidence of his scientific and research expertise may cast light on his culpability.

In his popular account of the hoax's exposure and his investigation as to the forger(s), J. S. Weiner wrote:¹

So varied were Dawson's ventures and so inexhaustible his energy that in 1915 we find accounts in the newspapers of his experiments with 'flaming' bullets —phosphorescent anti-Zeppelin bullets.... It accords with our estimate of Dawson's originality, ingenuity, and flexibility of mind.

In the subsequent extensive literature on Dawson, no one has hitherto pursued the bullet.

The Zeppelin was a type of rigid airship developed in Germany in the 1890s, formed of a fabric-covered rigid metal framework, with transverse rings and longitudinal girders, containing a dozen or so 'balloons', bags filled with hydrogen; it was propelled by several engines in gondolas suspended from the main structure. When war with Germany broke out in August 1914, the British military had already been concerned for some years at the threat posed by Zeppelins, and with good reason as Liège and Antwerp were bombed within days. The first raids on England were in January 1915.² As Zeppelins flew beyond the range of artillery and as standard bullets fired from a fighter plane passed through the outer skin without igniting the gas, the Allies needed a weapon which could down the airships. Would-be inventors set to work, usually starting from the existing tracer or spotlight bullets which incorporated pyrotechnic flare material, such as phosphorus or magnesium, to create a flash or smoke puff on firing or on impact to help gunners assess accuracy.

The earliest report of Dawson's bullet in the press was by the *Sussex Express* on 11 December 1914: 'FLAMING BULLETS FOR DESTROYING AIRCRAFT / UCKFIELD SOLICITOR'S INVENTION'. Doubtless drafted by Dawson, it was printed adjacent to the summary of Dawson and Woodward's second Piltdown paper to the Geological Society a few days previously. It stated that Dawson had invented and patented a flaming bullet which was, for example, a regulation pattern Army bullet in which a cavity had been bored from the apex, 20mm deep

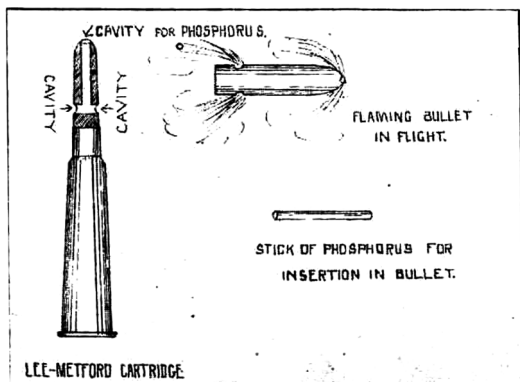


Fig. 1. Charles Dawson's flaming bullet, illustrated in the *Sussex Express*, 11 December 1914. The lateral cavity is not mentioned in the text.

and 2.5mm wide (Fig. 1). This cavity was filled with yellow phosphorus to just beyond the apex. The phosphorus was ignited on firing from the rifle or on the slightest contact with another body, such as the envelope of an airship or balloon. However the bullets needed to be kept in a watertight case filled with water, like a sardine tin holding five, until immediately before discharge. Alternatively pellets of phosphorus could be kept in a wide-mouth bottle and inserted into the bullet immediately before discharge. In a recent test a bullet passed through two fences and, embedding itself in a green tree, set fire to it.³ Dawson even put the story out through the Associated Press in London, with the added information that he had offered the bullet to the War Office.⁴

An abbreviated version of the report appeared in the *Sussex County Herald* the following day, with a sketch 'specially prepared by Mr Dawson for the "Herald"'. The editor, Arthur Beckett, brought the invention to national attention in a letter to *Land and Water: The World's War* (8 January 1915), further to an earlier letter pointing out the scope for such a bullet. But on 20 February *Land and Sea* printed letters saying that flaming bullets fired against hydrogen bags enclosed in an external envelope had achieved very few ignitions, that hydrogen was not an explosive unless mixed with air and that keeping the bullets in water could only be done at fixed stations.⁵ The next issue of the *Express*, on 26 February, under the headline 'THE FLAMING BULLET / FURTHER EXPERIMENTS', quoted *Land and Sea* but said 'we learn that the experiments which Mr Dawson has made with the bullet have been very satisfactory.' What followed, though, was only the hypothesis that the spaces between the hydrogen-filled balloons in the Zeppelin would contain enough air for the flaming bullet to cause an explosion. No experiments of firing bullets at balloons were mentioned. It was suggested that to make the bullets more portable, each could be covered by a rubber cap containing water.⁶

That is the last we hear of Dawson's bullet. Despite the statement that he had patented the bullet, no patent was awarded to him for a bullet or for anything else. What he had done was to apply for a patent on 27 October 1914, for an 'airship destroyer'.⁷ What he did not do was to submit a

specification for his invention, on the basis of which a patent might or might not be granted. Rather, he abandoned the application.⁸

The following week, however, James Frank Buckingham made three applications for 'mixture for use in incendiary bombs and the like; incendiary bombs and the like; aerial bomb'. Although he did not submit specifications for these, he made two further applications on 18 December 1914 for 'aerial bombs; and incendiary shells, bullets, and the like', the latter of which was followed by a specification and award of a patent on 2 September 1915.⁹ His design circumvented Dawson's shortcoming by sealing the phosphorus in the bullet with a material which would be melted by the explosion of the propellant cartridge or would ignite it on impact. Buckingham (1887–1956) was a Coventry automobile engineer and manufacturer, working for Riley and Sunbeam. In April 1915 the bullet was demonstrated to an officer of the Royal Naval Air Service, and after further experiments and modifications the Admiralty placed the first contract in October 1915. By the end of the war deliveries amounted to over 26,000,000 bullets, and the officer in charge of the Ministry of Munitions' Design Department for Small Arms Ammunition from February 1916 stated in April 1919 that he knew of only one Zeppelin and one kite balloon which British forces had destroyed by other means. The bullet was copied by Germany, Austria, the United States, France and Italy.¹⁰ In 1920 Buckingham was awarded the OBE, as 'Superintendent, Government Cartridge Factory, Worcester, Ministry of Munitions', but the citation was changed, presumably at his behest, to 'Inventor and Manufacturer of the Buckingham Incendiary Bullet'.¹¹

Buckingham had ready access to workshop facilities for his experiments. Who may have assisted Dawson? His younger brother Sir Trevor Dawson (1866–1931) was an ordnance expert with many patents to his name, but as managing director of the armaments manufacturers Vickers since 1906 was scarcely likely to find time to help Charles.¹² A more likely collaborator was Samuel Allinson Woodhead, MSc, FIC (1862–1943), principal of East Sussex County Council's Agricultural and Horticultural College at Uckfield. Woodhead was also public analyst and district agricultural analyst for East Sussex, and borough analyst for Hove. He carried out all the associated work, some 400 analyses a year, in the college's chemical laboratory, described in the prospectus as 37 feet by 23 feet with bench space for 22 students; the college was reimbursed for this use of apparatus, chemicals, etc. This arrangement continued after the college buildings were requisitioned in July 1915 and, if Dawson persisted with his experiments that late, the Army was doubtless willing to assist. Whether the carpenter's shop where students learnt to make and repair farm gates, implements, etc. was equipped to modify the bullets is perhaps open to doubt.¹³ Woodhead had already collaborated with Dawson on exploiting the 1896 discovery of natural gas at Heathfield and on the structure of beeswax in 1899, and had assisted in the early stages of the discoveries at Piltown.¹⁴

Charles Dawson doubtless was seeking plaudits for contributing to the war effort, but as a lawyer he must have been aware that award of a patent required more than an application without evidence which could be examined. It is possible that the *Sussex Express's* staff were unaware of such niceties, but Dawson did not correct. Furthermore, he very likely was relying heavily on other people's expertise and facilities. His flaming

bullet was not the only time when he was happy to claim more than the facts warranted.

NOTES

- ¹ J. S. Weiner, *The Piltdown forgery*, 1st edn (London: Oxford University Press, 1955), 181. For context, see J. H. Farrant, 'Prelude to Piltdown: Charles Dawson's origins, career and antiquarian pursuits, 1864–1911, and their repercussions', *Sussex Archaeological Collections* **151** (2013).
- ² Wikipedia contributors, 'Zeppelin', *Wikipedia, The free encyclopedia* <<https://en.wikipedia.org/w/index.php?title=Zeppelin&oldid=750155717>>, accessed 24 Nov. 2016.
- ³ *Sussex Express*, 11 Dec. 1914.
- ⁴ The AP feed was picked up by the *New York Times*, 27 Dec. 1914. Given the bullet's subsequent history, I have not pursued whether the War Office considered it in e.g. The National Archives, AIR 2/136, Preparation of Air Board memo. for War Committee regarding proposed use of explosive bullets against Zeppelins.
- ⁵ *Sussex County Herald*, 12 Dec. 1914. *Land and Water: The World's War*, 9 Jan. 1915, 15; 20 Feb., 10*, 16*.
- ⁶ *Sussex Express*, 26 Feb. 1915.
- ⁷ *The Illustrated Official Journal (Patents)* **26** (1346) 4 Nov. 1914, 1467, no. 21,956.
- ⁸ European Patent Office, *Espacenet patent search* <<http://worldwide.espacenet.com/>>, accessed 24 Nov. 2016.
- ⁹ *IO(P)* **26** (1347) 11 Nov. 1914, nos 22, 180–2; (1353) 23 Dec 1914, 1681, nos 24, 274–5. Other applications for incendiary projectiles made in 1915 led to patents in 1919. *Espacenet*.
- ¹⁰ *Grace's guide to British industrial history* <http://www.gracesguide.co.uk/James_Frank_Buckingham#cite_ref-2>, accessed 20 Dec. 2016. *The Times*, 16 Apr. 1919, 6.
- ¹¹ *London Gazette*, 30 Mar. 1920, 3779; 27 Jul. 1920, 7853.
- ¹² R. Davenport-Hines, 'Dawson, Sir (Arthur) Trevor, first baronet (1866–1931)', *Oxford dictionary of national biography*, Oxford University Press, 2004; online edn, May 2009 <<http://www.oxforddnb.com/view/article/46865>>, accessed 24 Nov. 2016. In 1908 Trevor was drawn into discussions about the British military response to the Zeppelin: A. M. Gollin, *No longer an island: Britain and the Wright brothers, 1902–1909* (London: Heinemann, 1984), 342. In the very different circumstances of 1893, when an experimental officer at the Royal Arsenal, Trevor obtained for Charles an analysis of the fabric of the Beauport Park statuette: Farrant, 'Prelude', 162.
- ¹³ East Sussex Record Office, ESC 181/1, prospectus (c. 1910) for a photograph of the laboratory (reproduced in P. Costello, 'The Piltdown hoax reconsidered', *Antiquity* **59** (227) (1985), pl. XXXI); C/E 10/25A, East Sussex County Council, Education Committee, Agricultural Education Sub-committee minutes, 1911–17, e.g. 12 Mar., 6 Aug., 15 Oct. 1915, 14 Mar. 1916.
- ¹⁴ C. Dawson, 'On the discovery of natural gas in East Sussex', *Quarterly Journal of the Geological Society of London* **54** (1898), 566; C. Dawson and S. A. Woodhead, 'The hexagonal structure naturally formed in cooling beeswax, and its influence on the formation of the cells of bees', *Annals and Magazine of Natural History ser. 7: 5* (25) (1900), 121–6; C. Dawson and A. S. Woodward, 'On the discovery of a Palaeolithic human skull and mandible in a flint-bearing gravel overlying the Wealden (Hastings Beds) at Piltdown, Fletching (Sussex)', *Quarterly Journal of the Geological Society of London* **69** (1913), 121. Costello, 'The Piltdown hoax reconsidered', argues that Woodhead was the Piltdown hoaxer, but has not published his full argument nor written it up completely with source references. His case has been weakened by the recent research on the material from Piltdown II: I. De Groot *et al.*, 'New genetic and morphological evidence suggests a single hoaxer created 'Piltdown man'', *Royal Society Open Science* **3** (160328) (2016).

