Summary

A Spanish ‘set’ of silver and silver-gilt liturgical furnishings from the Hospital de la Vera Cruz at Medina de Pomar, near Burgos, Spain in the collection of the British Museum is recorded as being mid-fifteenth century in date. Doubts, however, were expressed about the disparities in style and decoration of the pieces, the construction methods and, therefore, the attribution and date of the set. As part of a reassessment of the collection in preparation for a new Medieval gallery, conservation treatment, a technical examination and a scientific analysis were undertaken.

The conservation treatment principally consisted of removing an old protective coating with solvents. Where possible the objects were dismantled to assist the treatment and examination. Details of construction, tool marks, wear and old restoration were recorded. All pieces except the paten show evidence of either repair or alteration. Scientific examination of the enamels was carried out by X-ray fluorescence spectroscopy. The presence of chromium and the high lead content of the glass in some of the enamels are typical of nineteenth-century enamelling, confirming that alterations were made to the set during this period.

The stylistic evidence, taken in conjunction with documentary evidence, technical examinations and scientific results, indicate that the seven pieces appear to have been ‘enhanced’ at some stage in the nineteenth century to form the present ‘set’.

INTRODUCTION

A Spanish ‘set’ of liturgical furnishings, presented to the British Museum in 1911, is recorded as being mid-fifteenth century in date, Figure 1. The set consists of an altar cross, a processional cross, a ciborium, a chalice, a paten and a pair of candlesticks (1911,0621.1–7). The applied decoration comprises enamel, niello and coloured organic infill. These liturgical vessels, used in the celebration of the Eucharist (or Mass), are published as having been presented to the Hospital de la Vera Cruz (Hospital of the True Cross) at Medina de Pomar, near Burgos, Spain in about 1455 by its founder, Don Pedro Fernández de Velasco (1399–1470). The commissioning and presentation of liturgical vessels served to demonstrate religious devotion, but also to display wealth, power and authority. The saltire cross represents St Andrew, to whom Don Pedro had a special devotion; the Velasco armorials appear on every piece except the paten.

Sold from the Hospital de la Vera Cruz in 1903, the set was acquired by the renowned collector of Medieval works of art, J. Pierpont Morgan. In 1911 it was exhibited at the Society of Antiquaries of London by the Keeper of the Department of British and Medieval Antiquities at the British Museum, Sir Charles Hercules Read, after which Morgan presented the set to the Museum [1]. A brief guide to the history of the Hospital de la Vera Cruz was published in 1989, and a further publication also details the history and documentation relating to the hospital [2, 3].

Doubts, however, have been expressed about disparities in style and decoration between the pieces and, therefore, the attribution and date of the set [4; p. 197]. The disparities of the ‘set’ are more apparent when examining comparable works [5, 6]. As part of a reassessment of the collection in preparation for a new Medieval gallery, conservation treatment, technical examination and scientific analysis were undertaken. This provided an opportunity to examine each piece in depth and to record new information.

HISTORY AND DOCUMENTATION OF THE SET

Several items of liturgical furnishings are documented in an undated inventory of the sacristy of the Hospital de la Vera Cruz [2; p. 91]. The items include an altar cross, two
candlesticks and a processional cross, none of which is described as being decorated with enamels or armorials. No paten is listed in this inventory. An enamelled chalice decorated "con mis armas" [with my armorials] is listed, as is [in translation] "a custodia of silver gilt with its small silver chalice inside and with an ostensory" [2; p. 91]. The first dated reference to the items under review is in a bound document of 1895: an inventory lists items that match the pieces presently in the British Museum. It should be noted that all items in this document of 1895 are described as "esmaltado" [enamelled] and all, except the paten, as "con las armas de fundador" [with the armorials of the founder] [7; pp. 30–31]. The items under review are detailed in the document relating to the sale in 1903, along with a number of other liturgical items, none of which are decorated with enamel or with armorials [7; pp. 66–68].

**TECHNIQUES OF MANUFACTURE AND REPAIR**

The pieces are constructed of sheet silver, which has been hammered (sunken and raised), and a number of cast elements. Characteristics that distinguish sunken and raised elements from those that were cast are the thickness of the material and the surface texture. Sunken and raised elements are thinner and have smooth surfaces with hammer marks while cast elements are thicker and have a granular surface. The slightly curved parallel lines seen in several areas are the imprints of cuttlebone, the calcareous internal shell or bone of the cuttlefish, indicating that this was the moulding material used for casting, Figure 2 [8; p. 484]. All the pieces are fire gilded, a technique also known as mercury gilding. X-ray fluorescence (XRF) analysis indicated the presence of mercury in the gilded surfaces of the altar cross, chalice, ciborium and paten. The 'spongy' surface texture, apparent in several recessed areas, also indicates these pieces were fire gilded. The pieces are decorated variously with enamel, niello and coloured organic infill. There are no hallmarks visible on any of the objects.

Three methods for joining together major sections have been used in the manufacture of the set. The first method is the use of metal strip fastenings that are hammered in position to hold sections together mechanically. The second method, generally used on stemmed objects, is to use a screw, which is inserted from underneath to hold the bowl, stem, foot and covering plate together. This construction method is designed to assist in the assembly and dismantling of the individual elements.

The final method for joining is the use of solder, which is a filler metal with a lower melting point than the parts which it joins together. Silver solder is an alloy of silver that has a relatively high melting point (615–810°C), and soft solder usually comprises an alloy of lead and tin with a relatively low melting point (180–240°C) [8; p. 394; p. 423]. They can be differentiated visually by colour and surface...
A SPANISH MEDIEVAL ALTAR SET

morphology; a soft solder tends to be dark grey in colour and a relatively thick layer is needed to form a join, whereas silver solder has a silver colour and is applied much more sparingly. Medieval documentary sources show that a range of both silver solders and soft solders was available for manufacture or repair [9, 10]. However, there are a number of technical disadvantages to the use of soft solder on silver items and they would only have been used when there was a risk of damaging other joins or heat-sensitive material such as gems or enamel. Soft solder also has a lower melting point than fire gilding, which is applied at 250–350°C, making it unsuitable as a manufacturing technique for objects intended to be gilt [11]. Repairs in silver solder can be distinguished from original structural joins in silver solder by the fact that they are more randomly placed within individual elements. Repairs are seen on broken areas and sometimes have backing splints for additional strength.

The applied plaques with enamel, coloured organic infill or niello decoration are either set in a metal collar or secured with rivets or metal strip fastenings. These are mechanical means, requiring no heat. As silver soldering and enamelling take place at similar temperatures, it is preferable for them to be attached by mechanical means. Another advantage is that those elements requiring silver soldering and those with enamel can be separately manufactured and repaired.

The enamelling techniques of _champlevé_ and _basse-taille_ were used on this set. _Champlevé_ enamels are made from finely ground glass powder that fills depressions that have been gouged out of the surface of the metal. The glass powder is then fused in a kiln at temperatures between 700 and 900°C to adhere the glass to the metal surface, forming in this instance an opaque enamel. _Basse-taille_ is a variant of the _champlevé_ technique: the glass powder composition produces a translucent enamel, and it is fused onto a gold or silver support. A low-relief design is chased or engraved into the surface of the metal support, which is visible through the translucent enamel [12].

THE 'SET'

Observations of features relating to construction, materials and tool marks were made with the aid of a stereomicroscope using magnifications of up to ×40.

_Altar Cross: 1911_0621.1

This is a cross, 42 cm high, designed to be placed on the altar during the Mass. The front depicts the corpus, or body of the dead Christ, and the reverse contains a relic of the True Cross, in whose honour the hospital was dedicated. The elements comprise a foot, a two-tiered architectonic stem with figures and the cross itself. The applied plaques on the foot and the trefoil plaques at the terminals of the cross are enamelled, as are areas behind the figures.

The proportions of the cross are unsatisfactory; there is no hexagonal stem section as might be expected either between the cross itself and the upper tier, or between the lower tier and the foot. The cross section is very crudely joined to the upper tier, and the decorative edge at the foot is punched in a cursory and irregular manner.

The cross could not be dismantled because the covering plate underneath the foot is fixed in place by the rivets securing the enamel plaques to the foot. In certain areas the corpus figure has a granular surface texture, indicating it is cast rather than _repoussé_, although the reverse could not be examined to confirm this. There are various indications of repairs and alterations to the _cross_. The join between the upper tier and cross is built up of a hexagonal tube about 1.5 cm long with the end cut into an irregular v-shape. In this v-shaped recess the round shape of the side of the bottom trefoil is joined. The appearance of the imprint of cuttlebone seems to be consistent both on the reverse of the trefoil cresting and the figures on the architectonic stem, although repairs obscure the reverse of sections of the trefoil cresting. Repairs at the trefoil cresting (some with backing splints) and the join between the upper tier and the cross are made with silver solder. The presence of soft solder is noted at the front of the cross on the trefoil cresting, at the rims of the enamelled plaques and on parts of the stem, Figure 3.
Processional cross: 1911,0621.2

A cross, 43 cm high, mounted on a long staff, or rod, that is carried in procession to and from the altar at the beginning and end of the Mass. This type of cross, the cross raguly, modelled in the form of a tree trunk with the branches cut off, and patterned to resemble bark, is commonly seen in Spain. The cross is constructed from tubes onto which the cone-shaped branches are joined and has a wooden core within the vertical element. The cross fits into a stem with a large knop with six diamond-shaped projections, set with armorial plaques enamelled with the arms of Velasco. Some of these armorial plaques have been inserted upside down, perhaps indicating a carelessness or haste in assembly. On the reverse of the cross there are repairs at the centre; on the front of the cross, repairs can be seen underneath the hands of the corpus. Behind the head of the corpus there are tool marks indicating a branch has been removed, Figure 4. The corpus is extremely similar to the corpus on the altar cross.

A pair of candlesticks, 1911,0621.3–4

Light carries a mystical importance in the Christian doctrine: it signifies the presence of Christ and lit candlesticks are set on the altar during the Mass. Altar candlesticks usually take the form of domestic candlesticks. Although these two candlesticks differ slightly in size, they were almost certainly made as a pair and are both c.22.5 cm high. Each has a circular nozzle and hexagonal lobed pan with a crenellated edge. The hexagonal knop at the stem has six diamond-shaped projections, each set with niello plaques with the arms of Velasco alternating with a saltire cross. It is interesting to note that, by comparison to the rest of the set, only these two candlesticks are partially gilt. Several repairs made with silver solder are found on the crenellated edge of the drip pans.

Ciborium: 1911,0621.5

A covered container for quantities of the sacramental bread or wafer, placed on the altar during the Mass. This ciborium is 38 cm high and comprises a foot, a stem with a knop and a bowl with a hinged cover, fitted with a crescent finial. The foot, knop, bowl and cover are engraved, and there are six niello plaques set into the knop. There are three enamelled plaques applied to the foot with rivets, which are similar to the rivets securing the two plaques on the foot of the altar cross.
The form of this piece is highly unusual. It is rare for a ciborium to have pierced rims at the bowl and at the cover, and for those pierced rims to differ one from another. The standard finial for a footed ciborium is a cross, and here, the crescent finial, ridged to contain the wafer, suggests this piece also acted in some way as a monstrance. It is, however, uncommon to find the crescent exposed: crescents for the wafer are usually either contained within glass or rock crystal or are shielded by an architectonic canopy or rays. Both the unusual form and the decoration of this piece have elicited comment in the past [4; p. 197], and as recently as 2007 during an informal study session held at the British Museum. There are two hands apparent in the engraved decoration: one, less accomplished than the other, is responsible for engraving alternate segments of the cover and the scenes on the bowl.

As with the trefoil cresting on the altar cross, the imprint of cuttlebone appears to be consistent on the reverse of the trefoil cresting. There are a number of silver solder and soft solder repairs to the pierced rim of the bowl and on the trefoil cresting on the cover. There is no gilding or trace of gilding present on the interior of the ciborium, which appears unfinished.

**Chalice: 1911,0621.6**

Central to the celebration of the Mass is the chalice, or cup, used to hold the sacramental wine. This chalice is 24 cm high and comprises a foot, a stem with a knop and bowl. The three applied shields on the foot, two decorated with enamel and one with a coloured organic infill, are mounted in reserved areas of the embossed decoration. The hexagonal outer stem is pierced with lancet openings to reveal enamelling on the inner stem. These lancet openings are crude in both visual terms and in manufacture.

The different sections of the chalice can be dismantled, Figure 5. The foot is attached to the stem by a screw made from tube and wire. The engraved lines on the underside of the foot and on the stem probably act as guide lines for correct positioning. The metal fastenings for the two enameled shields and the third shield with coloured organic infill differ slightly from each other, possibly suggesting different stages of application, repair or alteration. Each of the three fastenings is formed from a small tube, joined to the reverse of the plaque and inserted through a hole in the foot, with the end hammered over on the underside. The protruding ends of the tubes on the two enamelled plaques were cut into strips that splayed out over the underside of the foot as they were hammered down whereas for the other plaque the end was hammered down as one piece. A repair at the top of the stem is made of soft solder covered with leaf gilding, Figure 6. This gilding has a brighter yellow colour and a slightly wrinkled texture compared to the overall fire gilding.
Pat
ten: 1911,0621.7

The paten, or plate, for the sacramental bread is also an essential part of the celebration of the Mass and often forms a set with the chalice. This paten is 16 cm in diameter and is made up from one sheet of metal with, in the sunken centre, an applied medallion enamelled in the basse-taille technique with a scene of Christ in Majesty. The rim is engraved with part of the Lord’s Prayer.

CONDITION AND CONSERVATION

The components are generally in a stable condition. In some areas, however, the fire gilding has formed blisters and has delaminated, Figure 7. There are some minor cracks in every piece, but the most severe crack runs along the engraving on the rim of the paten. The enamel on every piece is fractured in some areas, and on the altar cross, processional cross and the paten there are losses. The enamel on one of the plaques on the foot of the chalice has been repaired with a coloured organic infill.

The metal surfaces were covered with a protective coating, possibly applied when the pieces went on display in the old Medieval gallery in the late 1970s, but no conservation treatment records relating to this survive. Scratches and brush marks were visible in areas where the protective coating had failed. In these areas a fairly thick tarnish had developed, Figure 8. The first stage of the conservation treatment was to remove the old protective coating using acetone (propanone) on cotton wool. The tarnish was then removed by cleaning the surface using cotton wool swabs moistened with white spirits and Silvo® wadding, followed by cotton wool swabs with white spirits alone, and lastly industrial methylated spirit, to remove any residues from the cleaning compounds.

No new protective coating has been applied as the current strategy at the British Museum to prevent the tarnishing of silver or silver-gilt objects is to scavenge hydrogen sulphide from the atmosphere by pumping the air in the display cases over zinc oxide pellets [13].

ENAMELS AND SCIENTIFIC ANALYSIS

Most of the enamels are made in the basse-taille technique; the trefoil enamelled plaques on the reverse side of the altar cross, and the edges of the saltire crosses and the Velasco armorials are in the champlevé technique. It should be noted that all the shields and saltire crosses are filled with translucent brown enamel and, except the armorial on the foot of the chalice, are surrounded by either blue or green basse-taille enamel.

Some of the enamels of the Vera Cruz set were analysed by non-destructive X-ray fluorescence (XRF) analysis. A micro-XRF spectrometer (Artax by Bruker) with a molybdenum tube, operated at 22 kV and 1.5 mA, was used with a collimator providing an analytical spot with a diameter of 0.65 mm. A helium atmosphere produced locally between the spectrometer and the object drastically reduced the absorption of low energy X-rays by air, enabling the detection of elements such as sodium, magnesium and aluminium. The surfaces for analysis were not cleaned or polished in any way. The analytical results represent the concentrations close to the surface, which may be altered compared to the bulk. Environmental impact leads to depletion and thus lower concentrations of alkali ions near the surface [14]. Sodium is most affected by this depletion, making an underestimation of its content in the analytical results highly probable: the sodium values are therefore not specified. Where sodium was detected, the detection limit for Na₂O was around seven weight percent (wt%) for a three-minute acquisition time.
For transition metal oxides the detection limit was around 0.04 wt%. The ambiguity in the sodium content also leads to a greater uncertainty regarding the analytical results in general; the analytical error was estimated to be around 10–20% relative. Nevertheless, three different types of glass could be identified on the set, see Table 1 for the analytical results.

Most of the enamels were made from lead-potash glass with a lead oxide content of 27 to 39 wt% and a potassium oxide content of 9 to 17 wt%. The levels of calcium oxide in this group of enamels were quite low, at around 1 wt%. Glass with a composition dominated by lead and potash is typical for enamels made in the nineteenth century [15, 16]. Additionally, around 0.05 to 0.3 wt% of chromium oxide was found in all the green lead-potash glass enamels. This is of relevance for this study, since chromium was not intentionally used as a colorant before the nineteenth century. Alexandre Brongniart, a leading figure in scientific circles in the first half of the nineteenth century, noted that the earliest literary reference to a recipe containing chromium is dated to 1803 [17].

In two brown champlevé enamels on the altar cross a glass with a characteristically low potassium oxide content of around 1 wt%, a calcium oxide content of around 8–10 wt% and a lead oxide content of around 2–3 wt% was found. Due to the problems in detecting sodium, as discussed above, the presence of sodium could only be verified in one of these areas, but the similar contents of the remaining elements confirm that a soda-lime-silica glass with a small addition of lead was used for these two examples of enamel. It is difficult to propose a date of manufacture for this type of glass, since it has been used from antiquity until the present day, albeit with variations in the composition. However, the two soda-lime-silica glass enamels from the altar cross, which are coloured brown by the addition of iron and manganese, might be made from Medieval glass [18].

<table>
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<tr>
<th>Object</th>
<th>Area</th>
<th>Colour</th>
<th>Colorant</th>
<th>Na₂O</th>
<th>K₂O</th>
<th>CaO</th>
<th>PbO</th>
<th>Type</th>
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<td>blue</td>
<td>Co</td>
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<td>15</td>
<td>0</td>
<td>33</td>
<td>lead-potash</td>
</tr>
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<td>blue</td>
<td>Co</td>
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<td>10</td>
<td>0</td>
<td>33</td>
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<td>–</td>
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<td>0</td>
<td>34</td>
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</tr>
<tr>
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</tr>
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<td>–</td>
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<td>31</td>
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<tr>
<td>Chalice</td>
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<td>4</td>
<td>1</td>
<td>–</td>
<td>soda-potash</td>
</tr>
<tr>
<td>Proc. cross</td>
<td>knop (Velasco armorial)</td>
<td>blue-green</td>
<td>Fe, Cu</td>
<td>–</td>
<td>9</td>
<td>8</td>
<td>–</td>
<td>soda-potash</td>
</tr>
</tbody>
</table>

Notes: The results have not been normalized and only the oxides used for the classification of the glass are listed. A '*' symbol indicates that no quantitative analysis was possible, due to the distance between the enamel and the spectrometer. The '-' symbol indicates that the concentration was below the detection limit.
Five areas analysed had a composition with higher potassium oxide contents ranging from 2 to 9 wt%. Although high sodium contents were only positively detected in two of these five areas, it can be assumed that in all five areas the enamels were made from either soda-lime glass to which potash had been added, or from soda-potash mixed alkaline glasses. In these enamels the calcium oxide content ranged from 1 to 8 wt% and no lead was detected. This type of enamel was found on the paten, the knob of the processional cross and on the trefoils on the reverse side of the altar cross. Again, this type of enamel is difficult to date, but it has been suggested that it was introduced, probably for technological reasons, in the mid-to-late fifteenth century, as it has been found on numerous works of art from this and later periods [19, 20].

**DISCUSSION**

Evidence of construction, tool marks, wear and old restoration seems to indicate a series of repairs and alterations to the original elements. The analysis of the enamels shows that some alterations were carried out in the nineteenth century.

The blistering and delamination of the gilding is thought to be caused by repeated and/or extensive heating either during the original gilding process itself, or more likely, during later regilding or repairs with silver solder [21; p. 118, 22]. The slightly pale colour of the gilding can be attributed to the same phenomenon. In his commentary on the 1892 Historical Exhibition in Madrid, Read also describes this custom of using a heat treatment and its subsequent effect upon the enamelling:

> These [medallions] have once been enamelled, but the enamel has now entirely disappeared, owing to the vessel having been passed through the fire to freshen the metal, a practice which seems to have been common in Spain, as a large proportion of the enamelled details on church ornaments of all kinds are now bare metal, owing to this somewhat barbarous practice [23].

These remarks by Read do not, however, take into account the fact that *basse-taille* enamel is particularly fragile and that several factors may account for its damage and loss over such a long period of time [20, 24, 25].

One explanation for the present awkward join between the upper tier of the altar cross and the cross itself may perhaps be that the cross element has lost its shaped terminal that would have originally slotted into a hexagonal stem section. The hexagonal tube could have originally formed part of a longer stem section.

It is unusual for the patron's arms to be as prominently displayed as they are on the altar cross. A more common iconographic scheme would depict an angel in the upper trefoil and the figure of Adam rising from a tomb on the lower. The Velasco family, however, were the premier family in the region, and it would not be unreasonable for their armorials to be so arranged.

The presence of two different types, and therefore dates, of enamel in the Velasco armorials on the altar cross is notable for this study, and may assist in the dating of the repairs and alterations. The armorials at both the lower trefoil and on the foot comprise the early, brown soda-lime enamel surrounded by blue or green lead-potash enamel that dates from the nineteenth century. The brown enamel in the upper trefoil was not analysed, but it is likely to be of the same composition due to its similar appearance; the blue enamel in the upper trefoil was analysed and is again of the lead-potash type. This combination and disposition of the enamels indicates that the brown, early enamel was still in place when the nineteenth-century enamelling was applied. Re-enamelling of Medieval *basse-taille* plaques in the nineteenth century is reported by Richter [25], but to find supposed Medieval enamel together with nineteenth-century enamel suggests that a 'hot' repair was carried out, the evidence for which, to the authors' knowledge, has not been published before. The complete re-enamelling of the plaques seems less likely, since in that case it is very probable that the high-lead-containing brown used on the cross to colour the trees would have been found throughout. It can, therefore, be assumed that the plaques containing the early brown enamels are also earlier in date, particularly since the presence of soft solder at the collar of these plaques indicates that they have been removed or repaired, probably to apply the nineteenth-century enamelling. As noted before, the rivets that currently secure the enamel plaques at the foot also fix the covering plate. Since the blue and green lead-potash enamel on the foot is nineteenth century in date, it can be assumed that these rivets must also have been applied in the nineteenth century.

The enamels on the chalice and ciborium are made from the lead-potash type glass and are thus nineteenth century in date. It cannot be ascertained whether these enamels replace original lost Medieval enamels or are nineteenth-century additions. The armorial plaque on the foot of the chalice is filled with a coloured organic infill and is fastened in a different manner to the other two plaques. It is not possible to assess whether the coloured organic infill is original, or replaces original or nineteenth-century enamel; the nineteenth-century enamel on the foot of the chalice is itself repaired with a coloured organic infill.

On the processional cross the composition of the blue-green enamel on the knob corresponds to the late fifteenth century or later. It is worth noting the removal of a branch from behind the head of the corpus. This alteration to the form suggests that the branch arrangement had to be adjusted for some reason, possibly for repair, or because the present corpus is a replacement for an original figure. The present corpus appears to be extremely similar to the example on the altar cross, but as the reverse of neither corpus could be examined, the methods of manufacture could not be compared.
The blue, green and violet enamels on the paten were of the same soda-potash type glass as the enamels on the reverse of the altar cross: none of these sections show later enamel, coloured organic infill or soft solder repairs.

The curious form of the ciborium may perhaps be explained by its description in the documentation. It is described [in translation] as “a gilded silver monstrance with its small silvered chalice inside and with its eucharistic host recipient … to bring Our Lord’s Body to the unwell at the hospital” [2; p. 91]. If its original function was to serve as both a travelling monstrance and a ciborium, this might possibly explain the rather strange, hybrid form. It is worth noting that the knops on the ciborium and the candlesticks are the only areas decorated in niello; this was perhaps chosen as a sturdier material than enamel for areas that would be subject to considerable handling. The difference in scale between the large niello insets on the ciborium knop and the small examples on the candlestick knops is such that it is not possible to determine if they are by the same hand.

The absence of hallmarks is not uncommon for the period, and was also noted by Read in 1911 [1; p. 477]. It is likely, however, that these pieces were made in Burgos, the greatest goldsmithing centre in the region, and to whose production some of the Vera Cruz elements are similar [4; pp. 196–197].

Read comments on the unlikelihood that these pieces were all of the same period and presented to the Hospital at the same date:

The pieces that I would put earliest are the custodia, the paten, and the candlesticks, possibly also the crucifix. But the cross raguly and the chalice seem later. These two may conceivably have been given by one of Don Pedro’s daughters, who became a nun at Santa Clara; her arms would be the same as her father’s [1; p. 477].

Stylistically, the chalice appears to be later in date than the other pieces.

Señor Guillermo J. de Osma, a Spanish historian and antiquary, corresponded with Read in 1911 after the ‘set’ came to the British Museum. These letters reveal that he, too, had doubts about the date, the enamels and the provenance of the pieces, suggesting “… But (it is not a large But) there ought to be a short Chapter III, of Doubts & Misgivings, leaving a choice of alternative conclusions …” [26].

CONCLUSIONS

The technical and scientific examinations of the components of the ‘set’ have provided new information about the assembly of the parts and the materials used in the construction and decoration of the ‘set’. They have also provided evidence of the number and details of the repairs and alterations. These examinations and subsequent analyses are not, however, sufficient to ascertain the date of manufacture of the seven pieces. Although much of the enamelling and associated repairs were carried out in the nineteenth century, it is not possible to determine the date of all the repairs, alterations and additions.

The circumstances behind the present appearance of the ‘set’ can only be surmised. By reason of their age, all Medieval works of art, particularly those that have had a continuous functional use, have been repaired to a greater or lesser degree. If the gilding on these pieces has been continually ‘refreshed’ to preserve the original luxurious and rich finish, this may have contributed to the delamination of the gilding in certain areas. Translucent enamel is particularly fragile and liable to suffer losses and damage.

The documentation indicates that only one chalice was decorated with Velasco armorials, yet the scientific analysis of the enamels shows that there are traces of early enamels on the armorials of the altar cross and the knop of the processional cross. By 1895, all the pieces except the paten that make up the present ‘set’ were described as enamelled and as bearing the Velasco armorials. This nineteenth-century enamelling is unlikely to have been carried out by the members of the community at the Hospital, but must have taken place in a skilled enamelling workshop, possibly in Burgos. Similarly, the niello decoration is likely to have been carried out by a skilled goldsmith. The soft solder may have been applied by less skilled craftsmen and the coloured organic infill may have been applied by members of the community, as its application required no special technical skills or machinery.

A peculiarity of this ‘set’ is that the feet of all the elements are different, suggesting that these elements were made at different times or possibly for different patrons. The cushion form of the knops with diamond projections is typical for the late Medieval period, and occurs on every piece except the chalice. This discrepancy might again suggest that the chalice was made at a different time to the other elements, or that the knop is perhaps a replacement, fitted when the chalice was dismantled to enamel the stem.

The concept of a set is a modern one: it is more usual for liturgical furnishings to comprise a disparate assemblage of objects brought together over centuries. These may have been presented as gifts from donors, from members of the community upon entry, in memory of individuals or as gifts from visitors. In this instance, it could be suggested that a group of items was altered at some stage in the nineteenth century to create a ‘set’, perhaps to honour the original founder of the Hospital. This alteration may have included the addition of Velasco armorials in enamel, the supply of two ‘new’ corpus figures to form a seemingly matching pair, or the replacement of lost enamels from existing armorials. Another reason to provide a unified and coherent ‘set’ would of course be to raise significantly more money once a decision had been made by the patrons of the Hospital to sell assets.
The stylistic, documentary, technical and scientific analyses have not provided definitive answers to the questions of date of manufacture and repairs, or the subsequent attribution of the 'set'. They have, however, reopened a continuing debate, and have formed a sound basis for new interpretation and further research.

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MATERIALS AND SUPPLIERS

- Cotton wool, acetone, industrial methylated spirit, white spirits: VWR International Ltd, Magna Park, Hunter Boulevard, Lutterworth, Leicestershire LE17 4XN, UK. Email: info@uk.vwr.com
- Silvo® duraglit metal polishing wadding: Reckitt Benckiser plc, 103–117 High Street, St. Albans, Hertfordshire, AL1 1TH, UK
- Cotton wool, acetone, industrial methylated spirit, white spirits: from the Department of Conservation and Scientific Research.

- All from the Department of Conservation and Scientific Research.

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REFERENCES

7. Archivo del Hospital de la Vera Cruz de Medina de Pomar, Libro de Actos de la Junta de Patronos 1894–1904.

NOTES

1. Niello is usually a sulphide of silver, copper and/or lead. The coloured organic infill is translucent and was not further analysed in this study.
2. Further stylistic analysis, investigation into provenance and the acquisition of the set by Morgan, and an examination of Read’s notebook commentary of the Madrid 1892 Exhibition will be included in a future publication by one of the authors (BMcL).