

A Preliminary Investigation into a Stumpwork Panel dated c1650

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Abstract

A 17th century stumpwork panel in the National Gallery of Victoria's (NGV) collection is currently being prepared for display. This paper briefly describes the history of stumpwork embroidery in England and gives a description of the NGV's stumpwork panel, including the frame and backing board, in which it is housed. Analysis of the panel was used to understand the materials and technology used to produce the embroidery and its housing. The first part of the analysis uses wood identification, and the study of screw and nail technology to determine whether the frame and backing board are original to the embroidery. The second part of the research uses x-ray analysis to gain information on metal components in the panel and backing board, which are not always visible to the eye. Microscopic examination was used to produce photomicrographs and diagrams of the ten types of metal thread used in the embroidery.

Introduction

A fine example of 17th century English raised needlework (also known as stumpwork) is currently being prepared for display at the National Gallery of Victoria (NGV) in 2007.

The conservation work on this panel is in its preliminary stages; however it was felt that it would be an interesting topic for the symposium due to the rarity of stumpwork panels in Australian public collections. The three dimensionality of the embroidery, coupled with a wide range of materials including complex metal threads makes this a very interesting piece.

This paper is divided into two parts. The first part gives background into the history of stumpwork embroidery in 17th century England and will describe the NGV's panel, including materials and techniques used to produce the panel. The second part of the paper describes the technical examination carried out to further understand the panel. This investigation is also divided into two parts. Part A investigates whether

the frame and backing board are original to the embroidery by identification of wood used and the attempted dating of nails and screws used in the construction. Part B describes how X-ray and microscopic analysis were carried out to further understand metal components such as nails and metal threads in the embroidery and backing board.

Part One: History and Description of NGV's Stumpwork Panel

Stumpwork in the 17th Century

Stumpwork appears to be a development of the raised and detached work which began to appear in the Elizabethan era (1558-1603) where pictorial compositions in embroidery were popular. However these were always put to practical use, such as to embellish bodices, stomachers, coifs, sweetbags, purses etc as well as furnishings (Wallis 2006).

Between the 1640's and 1670's however, three

dimensional pictures were worked which were purely decorative and these form a coherent and distinctly English form of domestic needlework (Nevinson 1950). Many pictures are worked in tent stitch on linen canvas but by far the most common are the stumpwork embroideries made in this time (Kendrick 1967). This needlework has a unique three dimensional appearance and “combines the work of the needle not only with high relief but even attempts at a more fully plastic representation” (Kendrick 1967). During the 17th century this was known as “raised work” but it became known as “stumpwork” from the end of the 19th century and this name is still widely used today.

Stumpwork was made by young girls from wealthy families to prepare items for their future households while at the same time displaying their needlework skills and showing their potential as suitable wives. Stumpwork was the culmination of a girl’s embroidery training and usually carried out between the ages of eleven and twelve. This can be seen in Martha Edlin’s work which is held in the collection of the Victoria and Albert Museum. Martha embroidered her silk sampler at 8, started her whitework sampler at 9 and then worked on her stumpwork cabinet for two years, aged between 11 and 12 (Bloxham 2006). Items commonly decorated during this period using stumpwork embroidery were pictures, mirror frames and small cabinets.

Patterns for stumpwork embroidery were taken from popular engravings of the time. Common themes used for raised embroidery were “the five senses”, “four continents”, “kings and queens” and “themes from the Old testament”. As motifs frequently recur in pictures, mirror frames and caskets, it is thought that the designs could be bought already drawn on satin but proof of this is yet to be found (Swain 1970). There is also great similarity in the small carved parts (frequently boxwood) used for faces and hands suggesting enterprising businesses produced and supplied these pieces to keen stumpworkers (Powerhouse Museum 2006). One of the endearing features of stumpwork is that no attempt was made at adjusting scale to achieve perspective or proportion, for example a bee or a flower could be half the size of a human.

NGV’s Stumpwork Panel

Provenance

The stumpwork panel was purchased in 1957 by the National Gallery of Victoria. Information found on the galleries collection database states that the work was produced in England between 1600 and 1650. The only other example of stumpwork that the NGV holds is a writing box dated c.1665 which shows religious narratives.



Figure 1: Stumpwork panel housed in its wooden frame

Imagery

Central imagery

The central image of the NGV’s panel illustrates the ‘kings and queens’ theme and exhibits two fashionably dressed figures wearing crowns. Both figures hold a sceptre and the king is handing the queen a challis, while a sword and orb is seen beneath their hands. The figures stand upon a rug, in front of a canopied tent. The king wears a doublet and patterned breeches trimmed with lace at collar and sleeves and has a floor length lined cape with a wide collar. The queen wears a gown made of embroidered silk and metal threads, finished with lace at the neckline and cuffs.

Persons represented in stumpwork embroideries are from the times of Charles the 1st and 2nd, however the identity of the royal couple in the NGV’s stumpwork panel is unclear. If the couple were identified it could be useful in dating

the work, which is clearly of interest due to the broad dating currently in place of 1600-1650.

Interestingly, Charles I married Henrietta in 1625 and was executed for treason in 1649. If the stumpwork did depict these figures it is likely to be produced before his execution in 1649. Charles II married Catherine of Braganza in 1662 and if the work depicted these figures it seems reasonable to assume that the work would have been produced after their marriage in 1662.

Surrounding imagery

The imagery used in the area surrounding the central tent recurs so frequently in stumpwork embroidery of this era, that the following general description by Nevison gives an accurate description of the NGV's panel. (Nevison 1950)

"Such scenes are normally set unframed in a country landscape, the foreground and side being filled by animals, birds and flowers, symmetrically arranged but closely set with that horror of empty space that characterises Jacobean decoration the animals are often repeated; the lion, the leopard, the stag, all seated, the kingfisher perched on an oak branch, are found on almost every piece, while a fountain basin, a pond with coral branch surrounds, and a fish, or a dog chasing ducks, a castle with five cupolas, and a Gothic battlemented house are almost as common. The flowers, mainly exotics, could be listed in the same way"

Additional images surrounding the king and the queen on the NGV's panel include a squirrel in a tree and a partridge in a pear tree. Other animals seen at side and front of the tent include a fox, a parrot, a hare, a frog, a caterpillar and a number of flying insects. The sky at the top of the panel shows a range of celestial possibilities including the sun, moon, raindrops, rainbow and clouds.

Materials of construction

The work is stitched through a ground of silk satin and a backing of linen. Below these layers are two layers of brown paper, and another layer of linen.

To create the three dimensional "stumpwork" effect, several different methods are employed. Cotton wool is used to pad out the costumes of the king and the queen. The hands of the figures are made from delicately carved wood with fine white silk fabric adhered to the surface. The forms of the stag and the leopard are also heavily padded however it is not possible to say what this padding is. Seed pearls (although many have been lost) are stitched on the king's and queen's crowns. A single coral bead remains at the bottom proper left corner of the work with surrounding loose threads suggesting that more pieces of coral were once stitched in this area. Finally, slices of clear mica have been used to achieve the windows of the castle and the manor house.

Decorative effects are produced with a large variety of metal threads. Metal threads are either gold or silver looking in appearance and have silk cores. There is a large selection of colours in both floss and chenille silk threads.

Stitches Used

One of the stumpwork panels' purposes is to display the skill and versatility of the maker's stitchwork and the variety of stitches used on the NGV's stumpwork panel certainly achieves this.

One of the most important stitches on the work is detached buttonhole stitch (also known as flying needle lace) which gives the work much of its distinctive three dimensional appearance and can be seen on features such as flowers and pears. Wire has been added around the edges of individual pieces to allow it to stand away from background when sewn on. Added texture is also achieved with spirals and twists of silk threads used to create patches of grass under some animals and under the castle and house.

Tent stitches are used for two dimensional flowers and satin stitch is used to achieve many of the other motifs such as water, hare, fox, dogs, kingfisher etc. Straight buttonhole stitch is used for many areas that are padded from underneath such as the leopard and stag, some parts of flowers and the fountain and the queen's collar and cuffs. Couched work can be found on the pillars and parts of fountain. Some of the embroidery was worked directly onto the

ground, but many motifs were stitched separately before being applied.

Frame and wooden backing board

The stumpwork panel is housed in a glazed wooden frame with mitred corners. The frame is constructed using a mahogany coloured, reverse section moulding, with its sight edge the part of the frame closest to viewer. A strip of beading, lighter in colour than the moulding, has been added to the inner edge of the frame. The moulding is screwed to a back framework, which adds depth to the rebate. The butt-jointed construction of the framework exposes end grain wood at the top and bottom, which is atypical of quality framing.

Removed from the frame the embroidery measures 433mm (high) x 543mm (wide). The embroidery has been nailed to a backing board with iron nails tacking all edges of the embroidery to the wood. Similar nails are also visible at the proper left and right sides of the backing board. Brown paper has been adhered to the underside of the backing board.

Part Two: Technical Examination

A) Examination into the Frame and Backing Board

As the care and quality of the stumpwork's framing seems at odds with the extremely meticulous embroidery carried out to produce the panel, it was questioned by curators whether the frame was original to the work. It was hoped that examination of the frame, backing board, screws and nails would help to date when the embroidery was attached to the backing board and framed. This would influence whether the stumpwork panel was displayed in its frame in the future.

Study of backing board

Nails

One of the nails attaching the textile to the wooden backing board was removed using pliers. On examination the nail resembles the following description of a hand-wrought nail. Hand wrought nails were cut and forged by hand and the physical characteristics of the

handmade nail are the roundish crested heads formed by hammer blows with long, irregularly tapered and squared shanks ending in points. Because of the time, effort and skill required to produce each nail they were a very precious commodity and were used again and again. This could explain the poor condition of the nail removed (Smith 1991).



Figure 2 a) pre 1800 nail and b) post 1800 nail
(Smith 1991)

Technology to produce nails changed almost everywhere around the world by early 1800's from hand wrought to machine cut nails. The machine cut nail has a rectangular tapering shank of iron, not hammered to a point by hand but tapered by a single angle cut across a plate of iron (Smith 1991).

From the study of the nails, it is possible that the embroidery was attached to the backing board when the embroidery was made, i.e. sometime around 1650. However it is equally possible that the embroidery was nailed to the backing board as late as 1800, as hand wrought nails were produced up to this date.

Wood

It was hoped that identification of the wood used in the backing board would provide a clue as to the time it was produced. If the wood was not available in England in the 1650's it would be unlikely that the backing board was contemporary to the embroidery. Due to the complex knowledge needed to identify wood, it was decided to enlist the help of Yugo Ilic; a private specialist in this field. A small sample of the wood (15mm x 2mm) was sent to Yugo for identification. The sample was taken from a splinter on the edge of the backing board.

Yugo identified the wood as *Pinus sylvestris*, also known as Baltic pine or Scots pine which is a softwood. Scots pine is native to Scotland, Scandinavia (excluding Denmark), Northern Europe and Northern Asia.

Scots pine is likely to have been available in England in the 17th century, even though it was not grown there. Deforestation had been a problem in England since at least the 13th century, as wood was a necessity for practically every industry as well as being relied on for heating and building. With the growing trade and industry seen in Elizabethan times, supply could not meet demand and by the 17th century there was a shortage of wood all over Europe. For this reason timber was imported from Scandinavia and Eastern Europe as they were the only major relatively untouched forested areas.

Summary of examination of backing board

In summary there was nothing found in the study of the backing board to suggest that it is not contemporary to the embroidery as the materials used, namely Baltic pine and hand wrought nails were readily available in the 17th century.

Study of Frame

Construction of frame

Holly McGowan-Jackson, Senior conservator of frames and furniture at the NGV examined the frame. Holly believes the frame is likely to be made in the 19th century as the fine detail and regularity of the moulding suggests machine made manufacture. Mouldings made in the 17th century were produced with hand tools resulting in surface irregularities which can be felt when one passes a finger along a moulding (Smith 1991). No such irregularity can be felt on the moulding used to frame the stumpwork panel. Holly believes the moulding was not necessarily intended for framing and that the frame was unlikely to be made by a professional. She noted the construction is of poor quality which is particularly obvious at the mitre joins which are badly misaligned.

Screws

It was hoped that the type of screws found on the frame would suggest a production date for the frame.

Screws were not available until about 1700 and were in fact quite scarce until the 19th century. 18th century handmade screws are easily recog-

nised as the spiral thread of the shank is hand cut with a file, and they have uneven and sharp threads. The slots in the hand filed heads were made with a hacksaw and were shallow, narrow and irregular and sometimes off centre.

The machine made screw made its appearance around about 1812 and being cheaper and more effective brought handmade production to a quick closure. Machine made screws were relatively uniform, with a blunt end, even screw threads and round even head (Smith 1991).

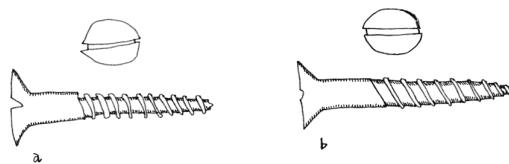


Figure 3: a) handmade and b) modern screw (Smith 1991).

Although only the heads of the screws on the frame are visible they are clearly machine made (19th century) as the head and the slot are highly regular with no sign of the slot being produced with a hacksaw.

Summary of examination of frame

Evidence suggests the frame is likely to be a 19th century construction due to fact that both the screws and the molding have been produced using a mechanised process, which was not available until the 19th century. It is therefore highly likely that the frame is a later addition to the work.

B) Study of Metal Components Found in Embroidery and Backing Board

X-ray analysis of Metal Threads

X-ray analysis was utilised to gain further information on the position of nails holding the backing board together and also attaching the embroidery to the backing board. Knowing the nail direction would facilitate the process of removing the embroidery from the backing board, should this be needed for the conservation treatment. X-ray analysis would also show clearly where any metal existed on the embroidery which was not always able to be identified with the naked eye.

Method

The panel was X-rayed in the paintings conservation lab of the NGV using an Andrax CP490 MPR 160 (Max kilovolt) with a focal length of 0.4 and 1.5 with a standard tube. The machine was used with the focal length of 0.4. X-raying was carried out by Paintings Conservator Michael Varcoe-Cocks who has the required industrial radiology licence. The work was placed face up on the X-ray plate and was covered with a thin sheet of Mylar and the industrial size X-ray film (measuring 355mm by 430mm) placed on top of the work. Due to the size of the film, the panel needed to be X-rayed in 4 sections. The film needs to sit directly on the work to be X-rayed but as it is very light it was felt this would not risk the work. However, the fragile surface of the textile needed to be protected from the heavy lead blankets which had to be placed over the work to contain the X-rays. To protect the work, a sheet of Perspex™ was suspended above the work on Ethafoam™ blocks. Lead blankets were then placed over the Perspex™.

A test X-ray was carried out using settings of 25 KV (Kilovolts), with 4 MA Millamps) at 20 Secs. Film used was D7 Agfa. Necessary safety precautions were taken.

The first X-ray was processed (in house) and found to capture images of the metal components clearly. The next 3 sections of the work were then X-rayed using the same technique as above. The films were processed and scanned into a digital form. A digital composite was then made from the 4 plates of industrial film.



Figure 4: Digital composite made from the 4 X-rays taken of the stumpwork panel

Information gained from X-raying

The X-rays revealed much information which is not evident when the work is examined by the naked eye and shows the wooden panel is made up of four pieces of wood. Two wide boards are joined horizontally towards the middle of the work and two narrow strips are attached on each side to create a panel the size of the embroidery. The X-ray also shows the grain and knots in the wood.

The X-ray also shows in detail the metal nails that are used to hold the strips of wood at each side to the larger panels. It shows that 4 long nails on the proper right and 6 long nails on the proper left are used to hold the wood in place.

The images also clearly show the small nails which hold the textile to the board and the direction in which the nails sit in the wood. This information will be very useful when or if the nails are removed to treat the work, as it will indicate the direction which these should be removed. Blurriness seen in the X-ray of the nails suggests corrosion and could make them more difficult to remove.

Much information was also gained from the X-ray about the metal threads used in the work. The X-rays show very clearly and in great detail where there are metal threads on the work which are not normally visible. The X-ray clearly shows that the stag and the leopard are supported by an armature of metal wire some of which appears to be iron based, as its blurring suggests corrosion and loss of form. The blurred area on the X-ray correlates to rust staining visible on the exterior of the leopard around the body leg junction.



Figure 5: X-ray image of stag, clearly showing the metal armature hidden beneath the embroidery

When the silk threads under the castle and manor house were examined it was thought they might contain a core of wire, as they feel very stiff and springy to the touch. However on looking at the X-rays these show up with only a little ghosting which is similar to the other areas which the naked eye can see are silk. Thus despite these having the appearance of a wire core the X-ray clearly showed that they were made of silk which has become brittle and stiff.

Microscopic examination of metal threads

Types of metal threads

The metal threads on the panel were investigated using a stereo microscope. Ten distinct types of metal threads were encountered during the investigation including some complex threads which had not been encountered by the author before. Sketches were made in order to understand the complex threads and photomicrographs were obtained under the stereo microscope in order to record the morphology of the different threads. (Figure 6).

Metal threads without silk core

1. Metal strip with open coil (Lizardine open)
2. Metal strip with closed coil (Lizardine closed)
3. Metal wire with coil and wrapped with fine silk (Pearl)

Simple metal threads wrapped around silk core

4. Metal strip wrapped around silk core (Thread)
5. Metal strip wrapped around silk core (Frost)
6. Metal wire wrapped around silk core (open)
7. Metal wire wrapped around silk core (closed)

Complex metal threads wrapped around silk core

8. Metal strip wrapped around silk core (frost): this thread wrapped around silk core then thread wrapped in metal strip
9. Metal wire wrapped around silk core (open): this thread wrapped around silk core then wrapped with metal wire

10. Metal wire wrapped around silk core (open): this thread wrapped around silk core and then wrapped with metal strip

Thread terminology in brackets above from Barker (Barker 1980).

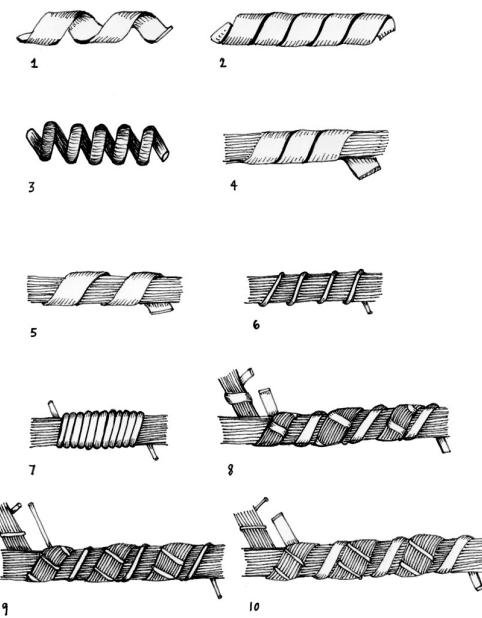


Figure 6: The construction of the metal threads 1-10 as listed above. Drawings of threads 1,2,4 and 5 taken from Barker (1980)

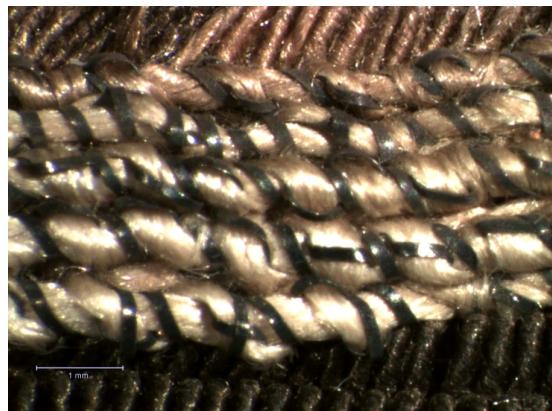


Figure 7: Showing thread 8

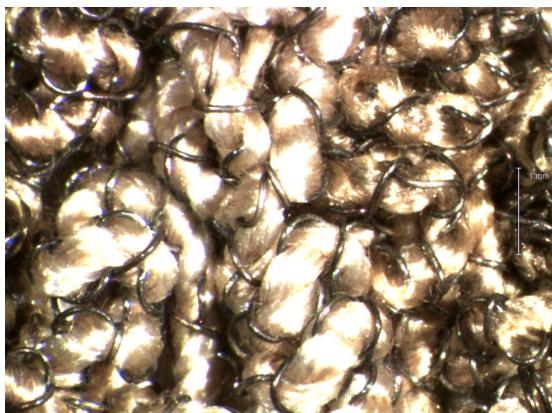


Figure 8: Showing thread 9

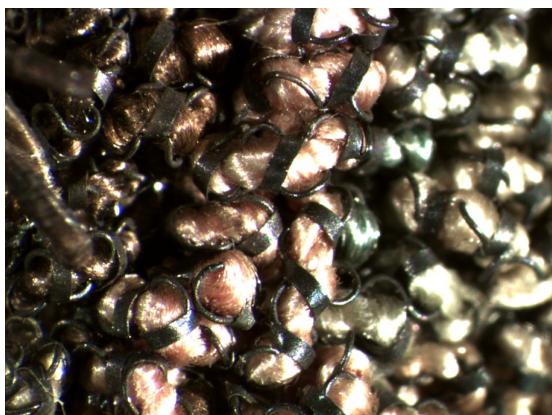


Figure 9: Showing thread 10

Conclusion

This paper discusses the investigations carried out on a 17th century stumpwork panel and how these contributed to the textile conservator's understanding of the panel.

The investigation followed two directions, the first being whether the frame and the backing board were original to the embroidery, which had obvious implications for the future display of the work. It was found that the frame is not likely to be original as evidence suggests that it was constructed the 19th century. No evidence was found however to suggest that the wooden backing board was not contemporary to the work.

The second part of the study focussed on using X-ray analysis and microscopy to investigate metal components found in the work such as nails and embroidery threads. The study allowed the author to document the construction of a number of complex metal threads and to clearly identify where metals were found in the

embroidery and backing board. It is planned to carry out further analysis of the metal threads using X-ray Fluorescence Spectroscopy to identify metals used and it is hoped that these results will be presented at the 2006 Symposium.

This study led the author into a number of areas not usually encountered by the textile conservator such as the study of timber, nails and screws. However by undertaking examination of these materials the author was able to answer questions raised by the curator as to whether the frame and backing board were original to the work.

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About the Author

Kate Douglas graduated with a Bachelor of Fine Arts in Painting in 1992 from Elam School of Fine Arts, Auckland University, after which she made and sold handcrafted objects to design shops in Auckland. In 1999 she graduated with a Bachelor of Applied Science specialising in Conservation of Textiles from the University of Canberra. While studying she worked part time at the Australian War Memorial Museum in the Textile Conservation Lab working on the freezer program and preparing items for display. She has worked at the National Gallery of Victoria as a textile conservator for the past 6.5 years.