Methodology

1. Dividing the object in work zones for easy reference and documenting the work progress.
2. Separating the loose and tangled threads and collecting them in their proper motif places.
3. Covering the motifs with the loose threads with net patches for the duration of the treatment.
4. Starting the treatment with motifs that are partially intact and in them, exhibiting the weak stitches and main points of the shape first, and then removing the missing stitches.
5. Shaping the loose motifs to closely follow the outline and cover with net stitched closely around the shape and trimmed. This could be a permanent solution.
6. Reconstructing the shape of completely detached metal threads on a silk crepeline and applying it in the appropriate motif.

Material Investigation

Examination of the silks threads

The silk couching threads were examined under various degrees of magnification. The findings using USB microscope (NikoLite ML411) and magnification X250 showed that the degradation of the dark blue silk thread is different than the deterioration in the rest of the colours. The fibres in the middle of the dark blue fibre thread become colourless and then this becomes a breaking point (Fig.23), whereas the orange and other colours floss threads seem to follow the common way of degradation of the silk, thinning out and breaking, as if pulled apart, with frayed ends (Fig.24).

Investigation on the dyes through chemical spot testing

Although the loss of colour occurs in the area of the thread most exposed to light, it seems that another factor is at play as well, since only one of the six colours is affected in this way. Schreppe’s method was applied to determine the type of dye used on the threads (Schreppe, 1986). After determining that the dyes are fast at room temperature, samples of all coloured threads were successively boiled in water, ethanol, glacial acetic acid and 20% ammonia solution. The release of colour was strongest in the acid which indicates that synthetic basic dyes are used. However, the results are not as dyes as the ammonia extract shank with zinc dust at room temperature produced no reaction. Also the dark blue dye is not indigo as its colour changes to light brown in ammonia.

Examination of the metal threads

The structure of the metal threads was examined with USB microscope. The photomicrographs showed that the threads are made from solid metal strips, not layered with additional material like paper or leather, tightly wound around a silk core in a 2-strand. For the silver thread the silk core is in white and for the gold thread the silk core is in yellow colour (Fig.31-34). Energy-dispersive X-ray analysis was carried out to determine the composition of the metal thread strips. The gold strip is made from copper alloy with a thin layer of gold only on the outer side of the strip. The silver strip is made from copper alloy with a thin layer of silver only on both sides of the metal strip (Fig.35-40).

Stitching Tips

1. In dealing with very long threads, it is helpful to unfold them ‘straight’ white careful to keep the folds memorized by the metal threads, and place them over a raised bar (like the shoulder of the magnetizer) or a hook above the bench. The screen works very much like the spool on a sewing machine. It significantly minimizes the handling of the metal threads and speeds up the work process (Fig.18).
2. Whenever possible work from the outline of the motif in, laying the threads in decreasing spiral. It is important to determine the starting point on the metal thread, as well as which thread is the inner and which outer side of the gold strip. The silver strip is made from copper alloy with a thin layer of silver only on the outer side of the strip. The silver strip is made from copper alloy with a thin layer of silver only on both sides of the metal strip (Fig.31-34). Energy-dispersive X-ray analysis was carried out to determine the composition of the metal thread strips. The gold strip is made from copper alloy with a thin layer of gold only on the outer side of the strip. The silver strip is made from copper alloy with a thin layer of silver only on both sides of the metal strip (Fig.35-40).

Conclusions

The most valuable outcome of this project was devising the treatment methodology for the metal thread embroidery and laying the foundations for the next conservator who will undertake the conservation of this beautiful object. The curtains are a lot more stable now and able to handle, display and store. The netting of the damaged motifs allows the work to be continued at any time and conducted in separate sessions. The opposite side of the curtains is covered with a rich embroidery design of magnolia and peony flowers, birds, bats, fish, phloxenises, butterflies and lilies motifs. The embroidery is executed in gold and silver threads, couched with orange, magenta, dark and light blue and grey silk floss threads. The main problem of the conservator is the failing silk couching threads of the embroidery, leading to the metal threads becoming loose and losing the shape of the motifs of the design with some motifs missing entirely (Fig.2). The problem is extensive and severe all over the entire curtains with almost every motif affected. The couching that is still in place is very fragile and can easily become loose. The problem is more pronounced where the couching has been done with a dark blue silk thread; over 90% of the damage is to these areas. A step-by-step methodology was devised to deal with the failing embroidery. To gain a better understanding of the reasons for the failing of the embroidery, both silk and metal threads were examined through chemical and microscopic analysis. The ethics of conserving or restoring the embroidery was considered in the context of the symbolism of the embroidery motifs.