Summer lecture: 'Stained Glass Windows of the Sainte Chapelle in Paris' by Frédéric Pivet, 17 June

This talk was by one of the conservators of these windows. The conservation began in 2010 to mark the 800th anniversary of the founder's birth and was recently completed. The speaker began by explaining the name 'Sainte Chapelle' or 'holy chapel' was a chapel within a medieval royal palace, of which there were 10 in France. All follow the plan of a reliquary, that is to house holy relics – here Christ's Crown of Thorns and part of the 'True Cross'. The Paris chapel, which dates to the 1240s, comprises two levels: the lower for the people of the palace and the upper for the king and his family, where there are over 630 square metres of stained glass in the 15 windows and the 1485 rose (above).

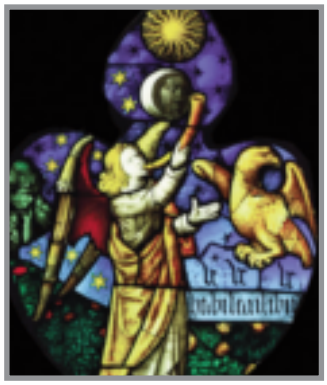
He moved on to the conservation work, in which his team had worked on the end windows. In earlier work in the 19th century a third of the glass and much lead had been replaced, and in the 20th a further small amount of glass. Examination of the external surface showed only iridescence, with no bad corrosion except in rare places, though everywhere there were heavy crusts of burnt coke and carbon dust, as all over Paris. On the internal surface, chemically corroded glass was rare, though there were remains of earlier conservation materials – linseed oil putty, plaster, gum arabic, natural resins and black iron oxide. In the condition survey the team used X-ray and infrared imaging to view the original painting beneath these products, and ultraviolet fluorescence to show where linseed residue needed removing so as to reveal the grisaille paint. In cleaning, particular cleaners were used to remove each deposition product – e.g. ethyl alcohol / acetone for the resin and black pigment. The same crusts were found on each surface, making the largely blue and red panels appear very dark.

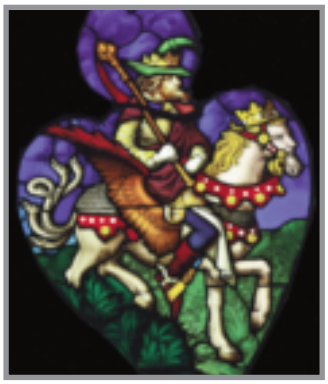
Over the paintwork, the team found a blackened layer of varnish that had been applied in the 1950s. In cleaning this from the paint, they discovered big differences between the 13C grisaille, which was very fragile, and the 15C paint, which was much less so, as the paintwork after cleaning was still perfect. They could also see which were the 19C replacements in the rose window, and had a diagram showing the added glass, which for a 15C rose window was not extensive.

As a reference for restoring the original linework, the team had 17C scaled watercolours of the windows done pre the 19C restoration. Where painted detail had disappeared it was redrawn on a float glass layer behind the original glass. The original 13C rose window had disappeared, but the team discovered early images of the 1485 replacement rose in the illuminated *Très Riches Heures du Duc de Berry* painted between 1485 and 1489.

Analysis of the glass showed that the 12–13C glass originated from two glassmakers in the forests outside Paris, except for the purple manganese glass, which was made only in Paris.

Looking at the 15C glass in the rose, the team found there was good use of the very expensive lined 'Venetian' glass particularly in the angels' robes; flashed glass had also been used extensively, for instance to depict stars on a deep blue sky and decorated livery (below). The latter had been worked largely with an engraving tool, though some had been acid etched (rare in the medieval period). Another feature was the insertion of 'jewels' within pieces of glass.





The team found also that there were several different styles of painting, for example in the faces.

The conservation work proceeded in stages beginning with removal of the panels – to remove concrete all along their edges the team had to drill holes in it every few centimetres. In the first stage of cleaning, they used a toothbrush on the 15C paintwork, after which the detail could be seen. Some repair leads were removed, and the broken pieces were edge-bonded with silicone or epoxy, and for some loose glass copper foil was used. Any missing glass was restituted – for example some of the Venetian glass. The panels were then releaded, and cold painting was applied where necessary.

The original system of ssaddle bars had been altered in the 19C restoration, and using the historical sources quoted above the team were able to restore the original plan.

Finally, to protect the original glass, it was remounted in a new brass ferramenta structure built 5 cm inside the original one, and a new external glass layer inserted in the original frame containing colourless thermoformed glass that gave viewers from the outside the impression of the original glass. The speaker described the project ethos as an 'illusionist' or 'aesthetic' rather than an 'archeological' restoration. *Chris Wyard*