

# THE PERRY LITHGOW PARTNERSHIP

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● CONSERVATORS

MP/SMP

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## ROCHESTER CATHEDRAL

Work commenced on 9th March 1987 and continued over a period of 10 weeks. The first 9 weeks were carried out in conjunction with the Courtauld Institute of Art Wall Paintings course, with two groups of three students working under our supervision, each group working for 3 weeks with 3 weeks of overlapping.

The programme consisted of conservation work to two areas - the tomb in the north east corner of the north choir transept, the so-called William of Perth tomb; and the southern bay of the east end of the Crypt.

### William of Perth Tomb (c.1350)

The purbeck marble tomb chest is surmounted by a painted recess, the spandrels of the arch also being painted, as are the ribs of the arch. The paint in the recess is laid on a lime ground which is directly onto the Kentish rag stone that forms the recess. The paint on the spandrels however, is again on a lime ground, but the ground is on a thin skim of lime mortar over rough stone work, also constructed of Kentish rag.

Although there are traces on both areas of an earlier scheme of decoration, probably a simple masonry pattern, the original scheme was a green vine pattern over a rich red background, embellished with pink popinjays in a regular diaper pattern. The vine pattern continued over the ribs and onto the spandrels, indeed the traces of red and green that remain elsewhere in this transept suggest that this was the scheme of decoration throughout this area. It would seem likely that the tomb's importance was emphasized by the addition of the popinjays. The red background consists of a red ochre overlaid with a thin red lead to give the richness and density of colour, the vine pattern is executed in verdigris with copper resinate; the birds were originally pink with black

drawing, but much of this has disappeared, probably due to the thickness of the applications of paint, leaving a white 'negative' shape. The feet and legs of the birds were painted in a very pale ochre. Stain tests to discover the medium indicated the presence of protein, suggesting either size or egg, but also indicated oil was present.

However, the pigment appeared fairly porous to water and therefore, either only a very small amount of oil was used, or the oil has leaked through from the 'preservative' coat that appears to have been applied, both on this tomb and throughout the choir. This coat darkened considerably and was applied over any limewash remaining on the paint surface, as the removal of the latter clearly showed. Indeed, in some instances this thick coat appeared beneath removed limewash, indicating that it had dribbled down behind during application.

#### Causes of damage and deterioration :

1. Salts : Tests for salts show a marked presence of chlorides, sulphates and nitrates in the lower part of the recess, accounting for the exfoliation of areas of the stone resulting in blistering and partial shearing away of fragments, plus the breakdown of the lime mortar joints. Without a full and complete investigation into the tomb chest, it is difficult to state the cause of the salts build-up; however, protimeter readings indicate increased moisture in the lower part of the recess and coupled with the dramatic changes in relative humidity and temperature due to the convector heater, plus the possibility of moisture entering the wall from the outside and finding it difficult to get out because of the cement pointing, all these factors could combine to cause quite dramatic salts movement resulting in bubbling, lifting and flaking of the paint layer.
2. Weaknesses within the stone : As other areas in the cathedral clearly show, Kentish rag is not an especially good stone and seems to vary greatly

in strength and condition. Diagram I shows a large area of blooming of the paint, leading to a discolouration of the red pigment. This was probably due to increased salts action in these stones, but because a small stone on the far left of the recess was also affected, it would seem to suggest a weakness in the stones allowing the salts to move outward more easily, rather than just a localized problem.

3. Breakdown of the pigment binder and lime ground causing powderying of the colour.
4. Clumsy removal of limewash in an earlier restoration programme, plus deliberate defacing and scratching.
5. The damage to the spandrels had similar causes to that of the recess, but had the additional problem in that the plaster support on which the painting had been executed had separated from the stone construction of the arch. This was due to both salts movement causing the mortar to break down and, more particularly, the lack of adhesion to the rag stone because of poor keying of the stone. This factor was very clear once the painting had been removed and the severe detachment of the painted plaster layer.

### Treatment

#### Painted Recess

To remove all the damaging salts from the recess it would be necessary to poultice the wall; in order to do this successfully it is important to soak and poultice the whole area to gain full movement outwards of the salts. As it was not possible, at this time, to dismantle the tomb chest and possibly reline it to isolate any further moisture incursion and to allow extensive poulticing, it was decided not to attempt poulticing at this stage, as the increased moisture and subsequent movement of salts without full evacuation of those salts may well have led to an increase in their deliterious effects.

Partial poulticing was also dismissed as this may merely have forced these salts not removed into other areas.

Therefore, it was decided to ease the outward route of the salts, which is principally through the mortar joints - as could be clearly seen through the excessive damage in the shape of crumbling and paint loss, leaving clearly visible outlines of stone blocks - by raking out existing mortar (where there was no original paint) and replacing it with a fresh lime/sand mortar in a 2:1 ratio. This will act as a form of poultice and may be considered sacrificial.

Since much of the paint was extremely friable cleaning was only possible in certain areas prior to fixing. These more stable sections were cleaned with de-ionized water and cottonwool swabs. This removed the surface dirt and more stubborn areas were removed with liniment of soap swabs, cleaned off with white spirit.

The powdering and blistered areas were fixed back with size infused through Japanese tissue paper and pushed back with either a soft brush or small natural sponges. The consolidated colour was then able to be cleaned as before and the considerable amounts of remaining limewash could be carefully removed with scalpels to reveal the colour beneath.

Areas that were flaking or virtually detached, often held only by cobwebs, had to be fixed with something stronger; especially as in many cases the limeground had become detached with the paint layer. These particularly loose areas were re-attached by injection-grouting with a lime (1) and H.T.I. ( $\frac{1}{2}$ ) slurry, sieved through a 120's screen and trowelled on glass to obtain a very smooth mixture. The area to be consolidated was first flushed out with a 10% IMS in water solution and then grouted and pushed back through Japanese tissue. This process worked extremely well and enabled us to then carry out the cleaning.

The whole recess was then given an infusion of size, allowed to thoroughly penetrate and dry, and then a further cleaning using wet fibre glass brushes was carried out to remove the very stubborn dirt held in the 'preservative' coat. This also removed any size still remaining on the surface.

The spandrels of the tomb were in such a precarious state and in imminent danger of completely detaching, indeed some part had already been lost, that it was decided to remove the paint layer and ground and transfer it on to fresh lime mortar. This involved a technique successfully carried out both in the crypt in the previous phase of conservation and in many places throughout the country. The painting has partially cleared where possible to allow maximum adhesion and on to this surface was applied 3 layers of silk crepeline and tissue with a water soluble animal glue as the adhesive, ending with a layer of tissue. When this was dry key marks were taken and cuts made along lines drawn, where possible, to coincide with areas of loss. The painting, plus facing was then removed in four sections. Any plaster which still stuck to the back of the painting was pared down using rifflers and scalpels; a coat of lime ground was applied to improve the adhesion of the adhesive coat of lime and sand mortar in a 1:1 ratio, sieved through a 120's screen, which was laid on the back of the painting approximately  $\frac{3}{8}$ " in thickness. Meanwhile the rotten mortar had been removed from the spandrels, the unkeyed stones scored and a new coat of lime mortar in a 1:2 ratio with local washed sand was applied. The pieces of painting were then rolled on to this fresh plaster. Finally, the facing was strained off and the painting, now secure, could be cleaned and remaining fragments of limewash removed.

The many missing areas of painting were repaired with a lime mortar similar to that used for the support plaster, toned to blend in with the overall appearance. Likewise, the hole at the base of the recess, which resulted from the removal of an old hair plaster repair, was filled and toned. It was decided to have this repair slightly below the level of the stone to make it clear that this was a repair, especially as the regularity of the hole suggests it may have been intentional, possibly a pudlock hole.

The cleaning and limewash removal on the painted recess revealed a series of regular round losses (Diagram I) which seems to indicate that something, possibly a drape of some sort, was attached to the painting at one time, though because the stone is not damaged it would seem to have been stuck on to the surface of the painting.

The final phase of the programme was to tone down the areas of paint loss on the recess. This was carried out with earth pigments mixed with water using the 'Tratteggio' technique for the smaller areas and a simple tonal wash over larger areas. Since there was so much loss it was deemed necessary to try and give an impression of how the original decoration may have appeared, although the conjectural reconstruction was undertaken - indicated by leaving the birds untouched - as it would be both impossible and imprudent to attempt any such reconstruction where so little of the original remains.

The conservation programme on the recess and spandrels of the St. William of Perth tomb was completed on 15th May 1987.

### The Crypt - Eastern End, South East Bay

This area was selected for immediate action as it was in imminent danger of collapse and the part that required most attention was identified as the southernmost section or quarter of this section, and indeed two other faces of this vault have been completely lost and subsequently replastered.

There are several reasons for this damage :

1. The Crypt was used as a coal store until fairly recently and this has not only caused a surface blackening of soot, plus sooty deposits actually behind the painting and in the plaster, but, more significantly the sulphur dioxide in the air from the coal has combined on the surface of the painting with salts moving through the plaster to form an exceedingly hard calcium sulphate crust. This has caused the surface plaster and paint to blister

and curl and in many cases to lift to the point of near detachment.

2. The supporting plaster has broken down through salts action resulting in a firmly hard crust beneath which the mortar is crumbling and separating on each layer. The salts problem may well have originated from when the presbytery floor was lifted with moisture getting in before it was relaid.
3. Extensive cracking over the whole of the east end of the Crypt, with particularly noticeable fissures running north - south, suggests severe movement and/or pressure from above, and this has clearly led to a weakening of the plaster support.
4. Deliberate defacement in the form of scratching, such as was discovered in the bay in the north east section of the Crypt, has resulted in large paint loss as has an attempt to scrub the paint surface, probably to remove the sooty deposits. This was identified during cleaning when brush marks could be clearly seen. It may also be possible that this is the remains of some sort of preservative applied at the time of an attempted cleaning programme. However, nothing that was used to remove it had any success.

### Treatment

Since all the above problems had combined to produce an extremely friable condition in the vault, the only course of action was to detach the painting and transfer it on to fresh plaster in a manner similar to that described for the spandrels of the Perth tomb. Only a very light brushing and cleaning could be undertaken prior to facing-up with silk and glue and because of the distortion of the surface the facing had to be cut with scalpels to fit into every dent and over every bulge to facilitate complete adhesion.

The painting was cut down in the manner shown on Diagrams 2 and 3 and the plaster removed often to a depth of 4 inches. A fresh lime/sand mortar in a 1:2 mix using

local sands washed and variously sieved, with the addition of '16 of High Temperature Insulation (HTI) material to give a pozzalanic effect, was then applied in a succession of coats over a 2 week period and then allowed to dry. Meanwhile the plaster adhering to the backs of the pieces of painting was removed. This was often very thick and had cobwebs, loose dirt and stones and soot behind it, indicating a long and continual period of detachment.

The pieces were then re-attached with the adhesive lime mortar coat and the facing steamed off.

With cleaning now possible with the painting being structurally sound, a series of tests using various chemicals held in poultices, was carried out to determine a suitable method of breaking down the thick crystalline layer which had trapped the dirt. These had varying results, none especially successful, eg. white ammonium bicarbonate held in sodium bicarbonate or paper pulp did partially clean, it also left a bloom and therefore had to be discounted. As the sulphate crust was so hard it was decided to use an abrasive form of cleaning and wet fibreglass brushes were the most successful, being the most controllable method. Although there was such a great deal of paint loss, often only incised lines of the roundels or the underlying masonry pattern remained, cleaning did reveal a particularly beautiful figure, drawn in red on the south-east section. Identification of the subject has not yet been possible, but certain details such as the fact that the figure is tonsured and is looking back over his shoulder to receive a scroll from another figure are now visible. The painting was obviously of a very high quality - the lines are very fine especially on details such as the hair, beard and eyes, and it is extremely unfortunate that it has been allowed to deteriorate over the years to such an extent.

After cleaning, extensive repairing was carried out, again in a 2:1 sand/lime mortar, however, this has dried somewhat lighter than hoped for, even after a series of tests using different mixes, and may have to be



re-adjusted in a future programme of conservation to the rest of the bay.

A partial cleaning of the north-east section of the vault was also undertaken as was the fixing and consolidation of loose painting in the soffit of the arch above the door in the south-east part of the Crypt. The painting, showing a chevroned pattern, is the earliest period of decoration and was discovered during recent electrical work. The painting had become very loose and in danger of falling and a temporary fixing with adhesive mortar was considered sufficient, prior to a full programme of conservation.

The work in the Crypt was completed on 9th May 1987.

DIAGRAM I



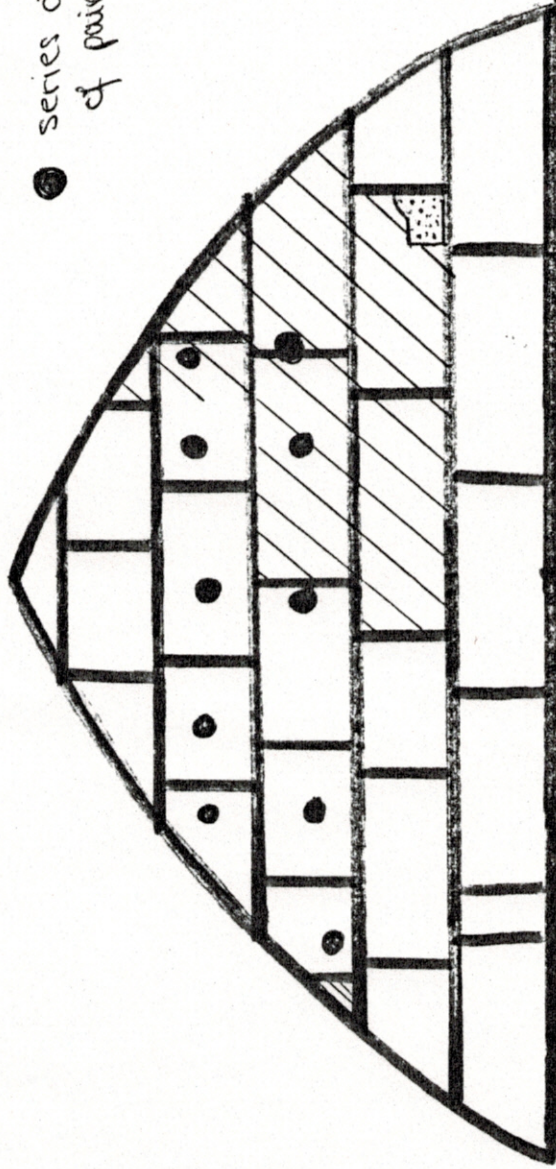
AREAS OF BLOOMING AND DISCOLORATION



Repair

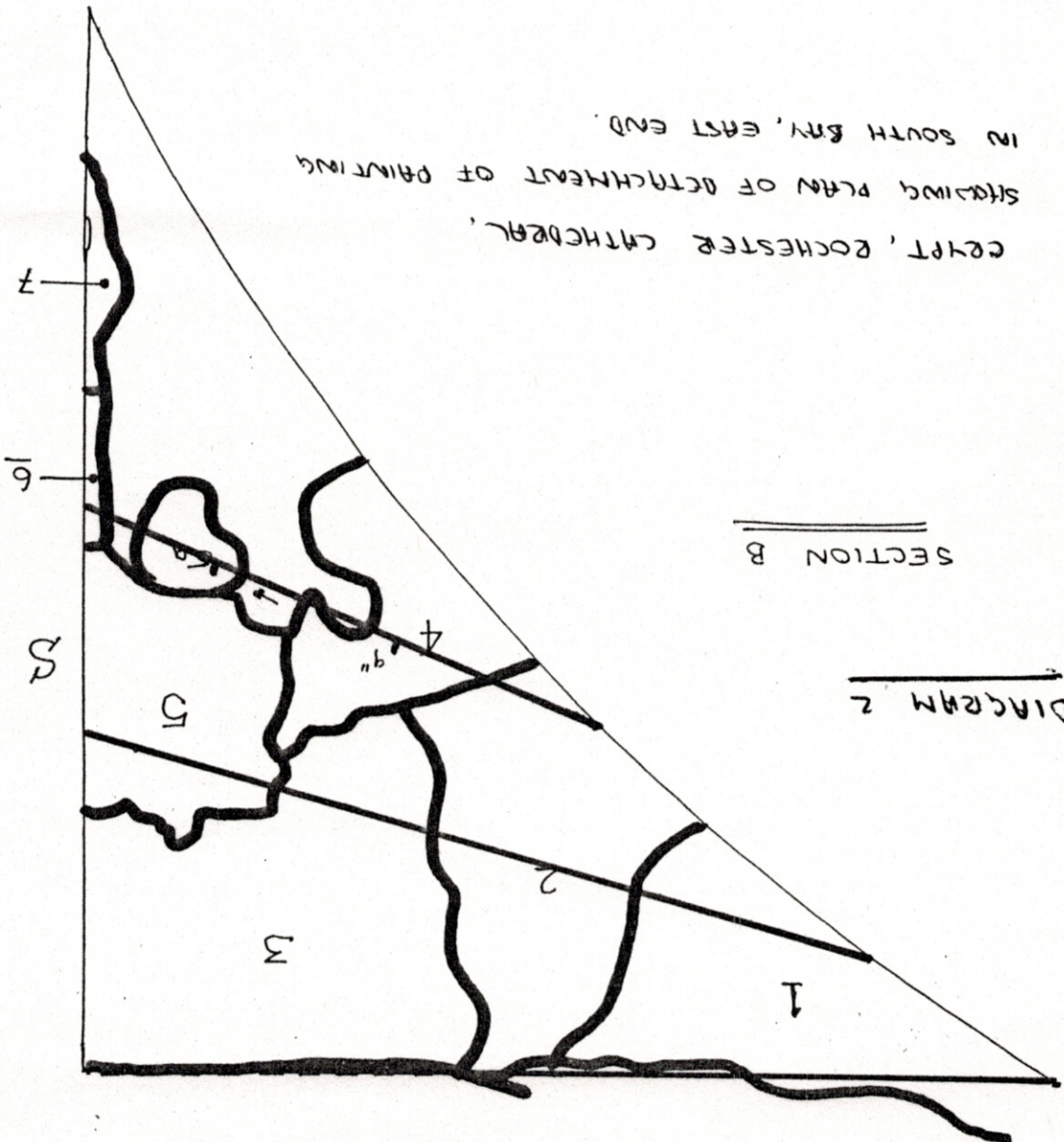


series of corresponding areas of paint loss



PAINTED RECESS: TOMB OF ST. WILLIAM OF PERTH

CEPT, ROCHESTER CATHEDRAL,  
STUDY PLAN OF ATTACHMENT OF PAINTING  
IN SOUTH BAY, EAST END.



SECTION B

DIAGRAM 2

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6

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2

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4

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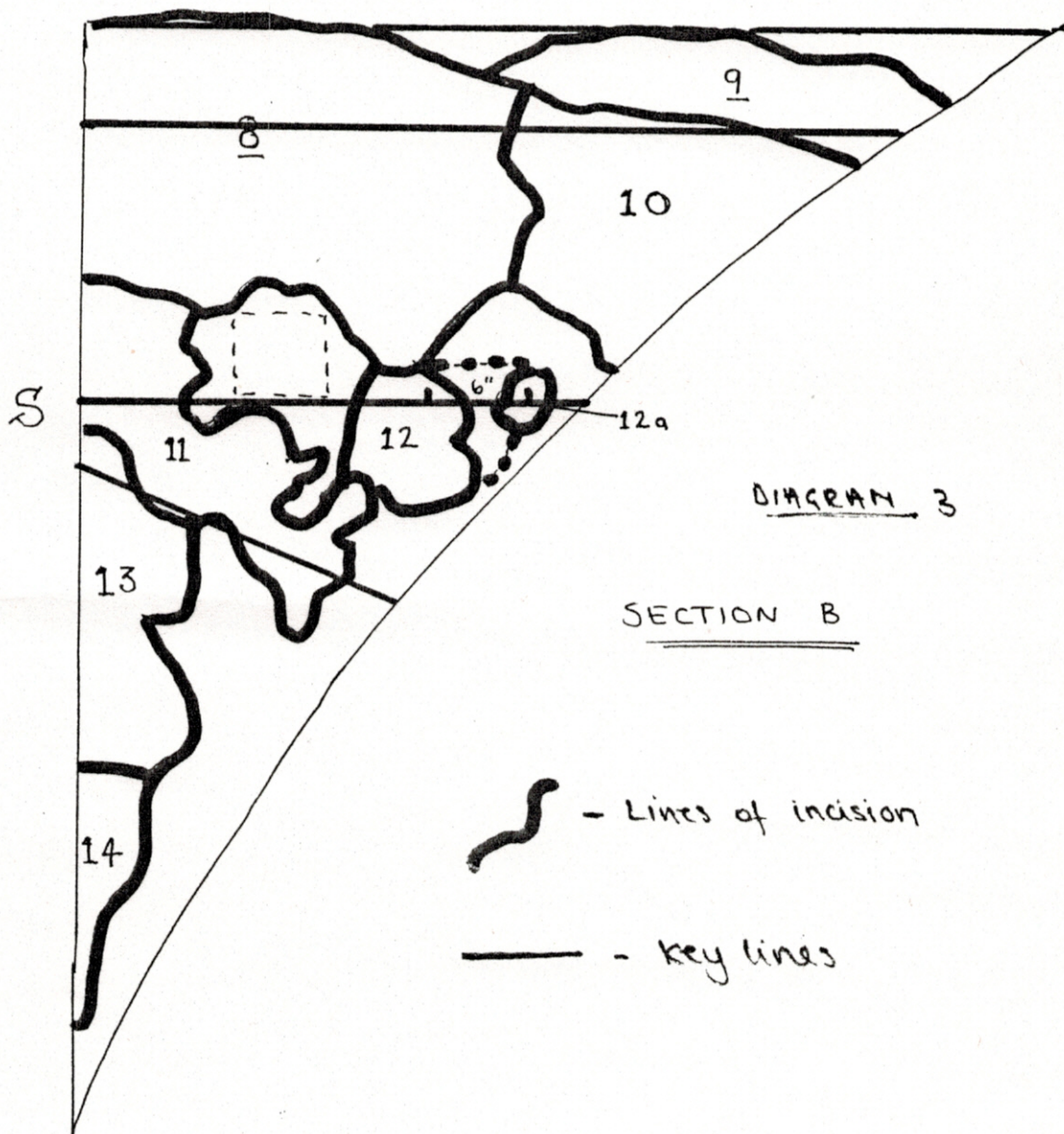




DIAGRAM 3

SECTION B

 - Lines of incision  
 - Key lines