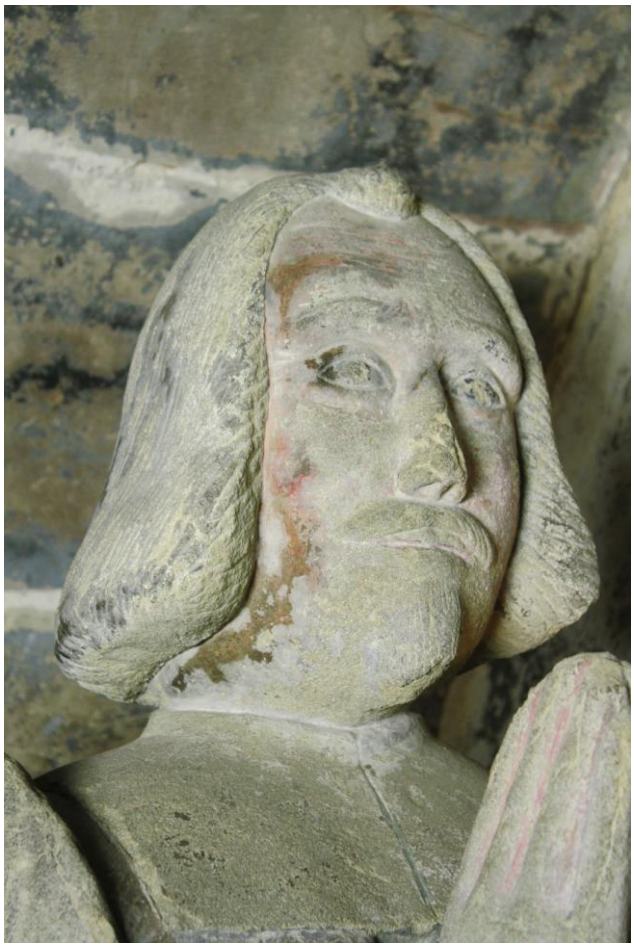
Final Conservation Report

for the Yale Monument

St Oswald’s Church – Oswestry - Shropshire



Elliott Ryder Conservation

Final Conservation Report for the Yale Monument

Church of St Oswald King & Martyr - Oswestry – The Diocese of Lichfield

The Works

Elliott Ryder Conservation were commissioned by church Project Manager and Chairman of the Building & Fabric Committee - Mr Paul Crosby, to undertake the conservation of the monument in-line with recommendations within our itemised submission (not report) of November 2020.

This report should be read in conjunction with our itemised submission. There were no works additional to that of our original submission, with the decision taken not to remove adjacent wall-plaster previously perceived as being defective.

Client

The PCC of the Church of St Oswald – King & Martyr.

Period of Works

All works were undertaken in a single phase between 29th July and 20th August 2021.

Conservators

Kieran Elliott ACR (Accredited Conservator/Restorer)
Susanne Ryder

Sequence of works

A range of semi-quantitative and fully-qualitative analyses were undertaken to establish ambient conditions (air/surface temperatures & relative-humidity levels) within and outside the church, including definitive moisture levels within the wall and salt levels within the internal plaster and disrupted stonework.

Defective and friable areas of stonework were consolidated with a liquid consolidant to restore physical cohesion, as were the fragmentary painted remains.

Solubility and cleaning trials were undertaken to establish the safest most effective techniques and materials to bring about a positive cleaning outcome to the whole monument, without disrupting the aged polychromy (applied paint and gilding). Cleaning of the majority of the monument took place, taking into account the results of those trials.

The Works

A scaffold was erected to provide free and un-fettered access to the whole monument. A photographic survey of the whole monument was undertaken before (during and after completion of all works.

A range of analyses were undertaken to provide an insight into how the adjacent building fabric has/is impacting the carved stone monument. Vulnerable stone and decorated surfaces were then consolidated prior to a range of cleaning techniques and materials.

Reversible support fillings were then inserted into vulnerable edges to prevent further loss of historic detail.

This project was made possible with kind financial assistance from an Historic England – Covid 19 Recovery Fund, part of the Government's Cultural Recovery Commitment.

Report Prepared in August 2021 by :

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1 Monument Condition

1.1 Upon erection of the access scaffold a thorough finger-tip survey of the monument was undertaken to establish its current condition, which was not wholly possible to undertake safely from a ladder during the original survey.

1.2 The substantial, upper, structural elements or embellishments surrounding the coat of arms were found to be in a sound condition. There were no obvious signs of misalignment, jacking or surface corrosion/staining, caused by internal iron fixings. The later marble dedication panel behind the kneeling figures has suffered localised areas of loss above the two iron load-bearing fixings in the bottom-bed. This is perhaps unsurprising; however there were no signs of progressive surface corrosion on the fixings to give cause for concern.

1.3 The monument appears to be well-built, against and into the fabric of the building and displays relatively tight, parallel joints. It should be noted that the embellishments are surface mounted (having direct contact with the ashlar, with no air gap. This provides additional close support (with the stone ashlar) but does not provide a vapour barrier, being in direct contact with the building fabric when the overlying (external) parapet was defective and falling / penetrating moisture was a problem. Both have been addressed historically and recently. The arched recess and return elements of the arch intrados (inside of the arch) are 60cm behind the plane of adjacent ashlar/walling, meaning it is within the structure of the building.

1.4 There are several anomalies, most notably the upper right-hand obelisk located on the cornice, which has been fixed incorrectly – that is three of the sides are decorated (painted and gilded). The undecorated rear is facing east (into the nave) and not against the wall as it should be. The lower right-hand pedestal is bedded significantly out of plumb (with a visible lean) when viewed from the east. Fortunately this is obscured by the replaced pew and is not nearly as apparent when viewed from the west. None of the bed or perpendicular joints on this block display any signs of movement or jacking and must be down to poor workmanship.

1.5 Higher plant forms were observed by us to be issuing from joints to the overlying parapet externally, during our initial assessment in the winter of 2020. These were removed and resultant access points for water filled with mortar by others, in a recent phase of exterior remedial treatment.

1.6 The whole monument (particularly the skyfaces) was extremely dusty, presumably from decades of accumulated dirt/debris, disaggregating (sandstone loosing physical cohesion) stone and deteriorating applied decoration. In a damp environment airborne dirt can become almost fused onto painted surfaces and can be difficult to re-solubilise, which proved to be the case in many areas.

1.7 After discussions with the Project Manager it seems the church now enjoys heating during cold months, controlled by a thermostat and not simply weekly 'comfort' heating for the different Sunday services. This will benefit the Yale monument and the painted decoration in particular, so there are not massive fluctuations in temperature and relative humidity, with values much more consistent.

1.8 One aspect that was unexpected after our initial assessment (when it was gloomy outside) was the impact of direct sunlight from the five-light, plain-glazed tracery window to the west. Despite the adjacent mature trees in the churchyard, during our time in the church, on days when it was sunny, sunlight magnified by the windows played across the surface of the monument, which will have caused numerous, additional heating and cooling cycles on/in the monument over the years with all its attendant problems. Such as the migration of moisture within the fabric and with it soluble-salts, when the church was perhaps heated less favourably and rising, penetrating and falling moisture were problems yet to be identified and addressed.

1.9 It is clear from the historic morphology/patterns of deterioration to the monument and adjacent wall-plaster, that defective : overlying parapet/joints; rainwater collection/hopper; external wall-pointing, concrete apron; drainage as well as poor architectural detailing of the string-course shedding rainwater onto the flared plinth beneath (and into the building fabric) have all contributed to the decay mechanisms witnessed.

2 Moisture & Salt Investigations

2.1 Given the problems outlined above and the historic problems with the ingress of excess moisture and an internal drying surface provided by a heated building, it was important to determine definitively, moisture and salt levels at/near the surface. A range of values were determined including, ambient (atmospheric) temperature and relatively humidity within the church, surface temperature on the wall-plaster and monument as well as the external fabric to determine the temperature differential between internal/external surfaces and likelihood of interstitial condensation, happening within the wall-core. A Speedy Carbide Moisture Meter ® was employed to determine accurately (fully-qualitatively) moisture levels within plaster and the stone of the monument. This is much more accurate than an electrical capacitance meter, which are adversely affected by soluble salts, ambient moisture on the painted plaster giving the misleading sub-surface values or 'trends' recorded previously. Dusts liberated by drilling the same holes from ground-level vertically 50cm and then at 1 metre increments, were used for moisture analysis and sampled semi-quantitatively, for the most common, harmful soluble-salts.

2.2 When drill-holes were de-dusted and vacuumed prior to liquid consolidation and subsequent filling, it was observed that the penultimate, float-coat layer was extremely hairy around the perimeter of the holes. That being a well-haired plaster, which provides additional tensile strength over the wall area, when the mortar is dry. The upper-most, much thinner/finer float-coat never usually has hair incorporated and accounts for some of the hollow sounds of de-bonding of the two layers between the plaster adjacent to the monument, but no reason to replace all of the plaster.

2.3 Results

2.3.1 In summary, the different ambient values internally/externally were recorded on a dry, overcast day during the summer, with May 2021 recorded as being one of the wettest May months on record. The same values and analyses should be re-taken in the winter, to determine the difference in seasonal values and how they might impact the building fabric and monument.

2.3.2 Ambient temperature and relative humidity were recorded at 2.00pm internally (next to the monument) and externally adjacent to the monument, with a Rotronic ® digital hygrometer.

	Internally	**Externally**
Temperature - Degrees Celsius	20.0 °c	18.0 °c
Relative Humidity - R/H	62.4%	52.6%

2.3.3 The values returned show when the church is unheated during summer months, values are more closely linked between internal and external environments, with the church containing more moisture internally than a dry day externally, but still only slightly above agreed optimum humidity values of 55% plus/minus 5% for a controlled museum environment. I expect the difference in values to be understandably greater during winter months. It is major fluctuations in ambient R/H that are more of a problem for stone antiquities and applied decoration in particular, in an internal environment, with different soluble salts moving in and out of solution (crystallising at or near the surface) with all its attendant problems.

2.4 **Surface Temperature**

2.4.1 Surface temperature was recorded at around 2.00pm internally on the springing of the arch and within the arched recess, on the plaster and marble, using a Profi ® digital, infra-red thermometer. The equipment is so sensitive values were recorded thrice and a mean value calculated and were as follows :

		Externally Equivalent Height
Arch – RH Intrados (inside of arch)	11.1 °c	17.4 °c
Plaster – Rear of Recess	9.9 °c	17.3 °c
Marble – Dedication Panel	10.3 °c	17.3 °c

2.4.2 The values returned show an approximate 7 °c difference between internal/external surface temperatures, with the internal surfaces being lower than external values. This will be reversed significantly during winter months when the difference between external and by then, artificially heated internal surfaces will be understandably far greater and RH in the church likely to be higher still, from heating such a huge volume of air.

2.4.3 The difference in the internal and external values will likely lead to unavoidable interstitial condensation occurring within the core of the building fabric, where there is a temperature difference, warm, moist, internal air moves towards the cooler outer parts of external walls, driven by a pressure difference, leading to water condensing within the core due to the temperature differential. The wall was recorded as being nearly a metre thick (91cm) when measuring from both sides of the glass line.

2.5 Moisture Levels

2.5.1 Moisture levels were recorded definitively using a Speedy Carbide - Moisture Meter®. Holes were drilled at 50cm increments for the first 2 metres above finished floor level, then every metre up to wall-plate level, to establish the effects of the historic rising, penetrating and falling moisture - from the rectified drainage, wall-pointing and rectified parapet/rainwater goods respectively. It is worth noting the concrete apron externally is 26cm above the height of finished floor level internally – ideally it should be below. More dust than was required for the Speedy Carbide readings was retained for later salt analysis.

Height above Finished Floor-level	% of Moisture within the Sample
5m	0%
4m	0%
3m	0%
2m	0.2%
1.5m	1.2%
1m	1.7%
0.5m	1.8%

2.5.2 New un-opened reagent was used for sampling moisture levels. Bearing in mind it is summer and even though the month of May was one of the wettest months of May on record, moisture values are well below acceptable limits. It is clear falling and rising moisture was not a problem. During our preliminary assessment the walls were damp to the touch giving misleading readings on the Protimeter in the sub-surface radar mode. The walls were likely damp to the touch as the applied decoration (wall-paint) is impermeable, trapping moisture behind and preventing ambient moisture or water vapour moving towards the lower pressure, external environment. We shall re-take all measurements again during the winter, when the building is heated and external values are much lower, and then compare the two sets of data.

2.6 Salt Analysis

2.6.1 All vertical plaster drillings were prepared for semi-quantative analysis to determine levels of the three most commonly found soluble-salts. A sample was also drilled from the stone substrate on the cushion of the female kneeling figure (where carved surface was deteriorated/lost) which was nearly 1 metre above finished floor level.

2.6.2 1 gram of dust from each location was dissolved for two hours in 10ml of de-ionised water to give a 10% w/v solution. Tap-water was used as a control-sample and analysed using the same test-strips, with de-ionised water supposedly much purer. Each location was sampled for chlorides, sulphates and nitrates using test-strips with the results as follows :

	Chloride 0-500ppm	**Sulphate** 0-500ppm	**Nitrate** 0-500ppm
5m	50 ppm	0 ppm	250ppm
4m	50 ppm	0 ppm	250ppm
3m	50 ppm	0 ppm	250ppm
2m	100 ppm	250ppm	125ppm
1.5m	250 ppm	500ppm	125ppm
1.0m	250 ppm	500ppm	250ppm
Female Figure	250ppm	500ppm	250ppm
0.5m	100 ppm	500ppm	250ppm
Tap water	50 ppm	25ppm	0ppm
De-ionised water	50ppm	0ppm	250ppm

2.6.3 The majority of historic deterioration from efflorescence or rather the repeated crystallisation of soluble-salts has occurred between 3 and 4 metres above finished floor level. Levels for the three salt types in this zone are now consistent with tap-water and of little concern. Levels of salts closer to ground-level indicate rising moisture was a more significant problem compared to falling moisture, with salt levels negligible in the upper reaches, as one might expect. It being a source of excess moisture being more of a problem, which has been addressed.

2.6.4 The stone of the female figure was also sampled to see if there was an appreciable difference between the upper plaster layers and soluble salts having moved through and being more concentrated and/or elevated in the more permeable stone. But this was not the case, with the plaster and female's cushion returning the same values, showing that the stone appears to have reached a point of equilibrium and does not contain a higher reservoir of salts waiting to crystallise. These values will be more interesting during winter months, when ambient environmental conditions and 'comfort heating' of the building will become more of a significant factor.

2.6.5 Whilst greater concentrations of chlorides and sulphates are evident 1 metre above floor level, even sulphate (which is a much more mobile salt – due to its molecular make-up) values are still within acceptable limits (albeit getting toward the upper limit for sulphates) and certainly difficult to justify removing and replacing wall-plaster. The walls are currently very dry, borne out by the Speedy Carbide readings. Removing and replacing lime-plaster for the sake of it would have involved a significant amount of moisture applied directly to the exposed substrate (stone work) from the plaster and to prevent the two or three plaster layers drying too quickly. This may be counter-productive and could mobilise soluble salts (which are there) and in our opinion it is prudent to leave the plaster alone.

2.6.6 The factors that led to increased ingress of excess moisture have largely been addressed (save for poor architectural detailing) with values never quantified, relying instead on empirical interpretation or not properly evaluating the efficacy of various interventions. This set of data is a starting point and the same values should be re-taken and compared during the winter, to establish if seasonal variations and artificial heating are a real problem for progressive deterioration. If anything successive layers of the non-permeable paint applied over lime plasters are the problem, preventing the lime layers from absorbing and de-sorbing moisture. This is a quirk of history with approaches to lime-washing and 'trends' in the treatment/decoration of church interiors changing with different custodians through the ages.

3 Consolidation

3.1 It was determined through solubility trials that the different paint binding mediums (a drying-oil and animal-glue) were not soluble in the solvent-mixture (Acetone : Industrial Methylated-spirits I.M.S. – 50:50) used as a carrier for the acrylic-resin consolidant - Paraloid B72. A water-clear consolidant with long-term stability and well-established conservation pedigree.

3.2 The edges of vulnerable paint layers, in particular the black paint beneath the horizontal gilded inscription at the level of the painted capitals, were consolidated with two cycles of consolidant applied by pipette. Liquid consolidant is drawn down between the often de-bonding paint layer and substrate and penetrates by capillary action, re-securing the paint back to the underlying layer when the solvent evaporates and resin cures. As there was no cupping or curling paint (just de-bonding) there was no need to re-lay paint back to the surface with a heated spatula, as the consolidant is a thermo-plastic resin. The material and technique employed was successful in restoring physical cohesion between the different layers.

3.3 Friable stonework, principally along laminations in the sedimentary sandstone and isolated areas of disaggregating stone (that is - deteriorated stone that has lost physical cohesion and is sanding to touch) were also surface-consolidated with two pipette applications of a 5% w/v solution of Paraloid B72 in the same solvent mixture. This was also successful in imparting physical strength back to stone weakened by soluble-salt activity, whilst still allowing the movement of moisture around consolidated areas in the future. There was no point undertaking deep-consolidation (as opposed to surface-consolidation) which effectively encapsulates areas more impacted by salt activity, this often exacerbates the problem of moisture movement elsewhere, plus salt levels within the areas of degraded stone sampled, were not high enough to warrant such a treatment route.

4 Cleaning Trials & Cleaning

4.1 The monument was decorated to give the perhaps more humble, local materials the appearance of more exotic, expensive, imported marbles, which was often a show of status. Very often colour-men, or painters of monumental sculpture were paid more than the carvers, such was their level of skill, particularly on alabaster monuments. It has to be said on this monument the painting and marbling in particular is fairly crude, but all the more interesting for that. Much of the intention of the designer and painter(s) was obscured by decades of accumulated airborne dirt and dust, which can often be almost fused onto surfaces particularly in a relatively damp environment coupled with the observed, direct sunlight from the nearby tracery window.

4.2 A range of techniques and materials known to work on such materials, were trialled on the palette of individual colours and surface finishes (marbling & gilding).

4.3 The applied decoration and individual pigments in particular will have deteriorated given the proximity of the nearby window and the play of light magnified by the plain glazing on the painted surfaces, causing photo-degradation or bleaching and/or permanent alteration of the pigment mixtures, with the animal-glue binders not being stable in the long-term either. With this in mind if, the window is ever to be cleaned (just vacuumed even) this affect will obviously be increased. Measures can be taken to mitigate against the deleterious effects of UV light and photo-degradation, in the form of protective UV film applied to the inside of the window, which I appreciate would be difficult on such glass and the ferramenta bars, but has been carried out successfully on many historic properties (English Heritage, National Trust etc) to protect light-sensitive objects inside. I appreciate it is a working building and not a museum – but seemingly plans are afoot to illuminate the conserved monument, in what is an often gloomy part of the building, to enhance its appeal further.

4.4 Sound painted surfaces, the 'marble' columns in particular, were cleaned with small, close-cell sponges, moistened with de-ionised water after pre-softening dirt with a paper-towelling compress, making accretions more soluble and keeping moisture to a minimum. Soft sponge is particularly effective in lifting dirt from the surface until it is exhausted, in a way that cotton-wool pads aren't - just skating over surfaces, often just polishing accretions. A weak 5% v/v solution of Vulpex ® (liquid-soap) in de-ionised water was effective for much of the additional painted surfaces with stubborn dry dirt, applied on cotton-wool swabs moistened with de-ionised water. Particularly tenacious dirt was reduced with a weak 5% v/v solution of liquid Ammonia also in de-ionised water. This material is at the far end of the cleaning spectrum and has to be used with great care on decorated surfaces, but proved successful in reducing the dirt unaffected by usually reliable materials. Both materials were thoroughly neutralised with de-ionised water applied on cotton-wool swabs. Given the level of historic soluble-salt damage present over the surface, applied moisture was kept to a minimum so as not to mobilise salts. Dry techniques (save for vacuuming undecorated stone) were inappropriate over the whole monument, such was the type and level of soiling.

4.5 Thankfully the monument was unmolested and has not been treated with waxes or other historic materials thought to be stable and inert at the time (which they proved not) to enhance or consolidate decoration, as I've witnessed on other monuments. All historic treatments are known to deteriorate, causing additional conservation problems, wax in particular breaking-down/discolouring, becoming increasing insoluble with age. That said the paint was in a sound enough condition not to warrant application of any modern, conservation-grade protective coating, which we would shy away from for the same reason as above, preferring more passive measures such as the protective UV film mentioned.

4.6 The horizontal gilded inscription at capital level was applied onto a black paint with a drying oil binder which has degraded to a characteristic craquelure (the appearance of crocodile-skin even under low magnification). There are two different phases of gilding, one overlaying the other, being slightly off-set, making it difficult to read once cleaned. There was no thought of removing the upper-most dedication, even if it had been feasible, as it is part of the history of the monument.

4.7 The uppermost section of the inscription had been applied over the horizontal joint, which is obviously more permeable than the stone, offering moisture and with it soluble-salts the path of least resistance with the resulting loss of material. No thought was given to re-painting areas of paint loss and neither should it be, being restoration and NOT conservation.

4.8 The later white marble inscription panel in the rear of the recess was found to be in a sound condition, with fragmentary remains of both black paint and preparation layers for gilding within the lightly incised lettering. There was no thought of re-applying these materials, knowing the inscription would be far more legible even after light-cleaning. The marble which was in a sound condition albeit having suffered chromatic alteration, that is loss of original surface polish, which there would have been at time of manufacture. Chromatic alteration in a sheltered location such as the recess indicates the applied finish (polish) has been compromised by prolonged condensation acting on the surface, which was/is being exacerbated by the warm heat source (bare bulb) providing daily heating and cooling cycles. The extent of alteration did not warrant application of a modern, protective conservation-grade wax (which still requires removal and re-application on a periodic basis) which is safe to use on a sound, crystalline surface such as marble. In chronically damp conditions vertical run-marks from condensation can be seen etched into the surface of previously flat, polished marble.

4.9 The marble was cleaned with a solvent mixture (known as the V&A mix) of de-ionised water and White Spirit 50 : 50 with the addition of a non-ionic surfactant to make them miscible applied on cotton-wool pads. This was neutralised with White Spirit applied on cotton-wool pads.

4.10 The two load-bearing fixings on the bottom-bed had expanded historically forcing off the front edge of the stone, which was not within the recess. There were no signs of progressive corrosion on the exposed iron surfaces and their removal and replacement with stainless-steel fixings was deemed inappropriate, due to causing avoidable damage to adjacent stonework, plaster and marble no matter how carefully executed. Instead they were treated insitu by being abraded with a metal polishing-mop to remove any loose corrosion. They then had two brush applications of Jenolite (a corrosion inhibitor containing Orthophosphoric acid) which were allowed to dry, prior to a single 10% w/v application of Paraloid B72 dissolved in Acetone : I.M.S. to provide additional protection to the corrosion inhibitor.

5 Maintenance Considerations

5.1 There is very little that can be done directly to the monument in terms of direct maintenance and external deleterious factors have been addressed. The fragmentary remains of painted decoration is so scant it is best left alone rather than annual de-dusting as would be advocated on similar scale monuments. The vast bulk of accumulated dirt and debris had collected on the upper skyfaces which would necessitate a maintenance team and/or parishioners working at height, which is perhaps best left to specialists. As the surfaces have been carefully vacuumed and consolidated, there should be very little progressive loss of material, but bear in mind everything deteriorates with age and deposition of airborne dirt/dust never stops in such a large building.

5.2 We kept the pews back from the edge of the monument to allow more air circulation whereas previously the pew uprights had been tight against the wall, with signs of mould and timber degradation at low-level, where historically in a damp microclimate. This should continue to be the case if the pews are not to be (re)moved as part of the planned re-ordering, maintaining a small gap between the timber and the wall-plaster.

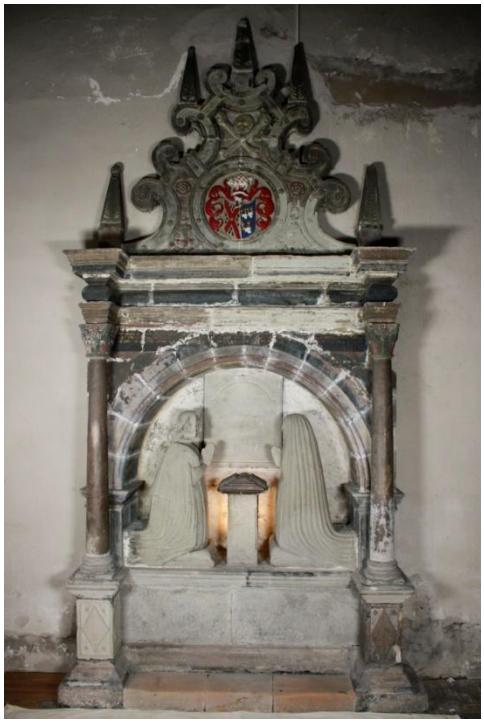
5.2 **Lighting**

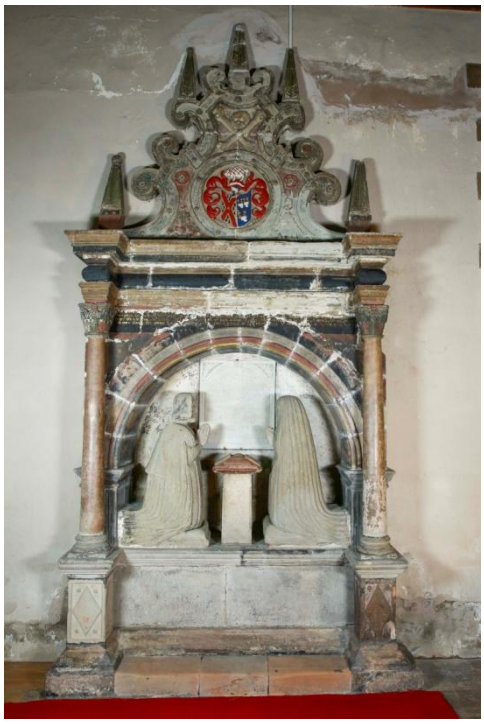
5.2.1 We understand the area adjacent to the monument is due to be re-ordered, with the object potentially lit more sensitively to enhance its position and cultural significance within the building, which is already full of objects of interest. Careful consideration should be given to the lighting source regards to proximity, intensity and type of light (wavelength) as well as duration. As mentioned previously the adjacent large, clear-glazed window would provide a significant increase in Lux levels in this area of the building, just from a detailed vacuum to remove significant accumulated dust/dirt. With a significant increase in Lux levels and light of particular wavelengths comes accelerated deterioration from photo-degradation as outlined previously and steps would need to be taken to ameliorate against this uplift.

5.2.2 Whilst we appreciate it is a working building, the monument is of museum quality and is unlikely to have received the funding it did otherwise and as such should be afforded the respect it deserves for a significantly cultural object, especially after the cost of detailed conservation works funded by a public body.

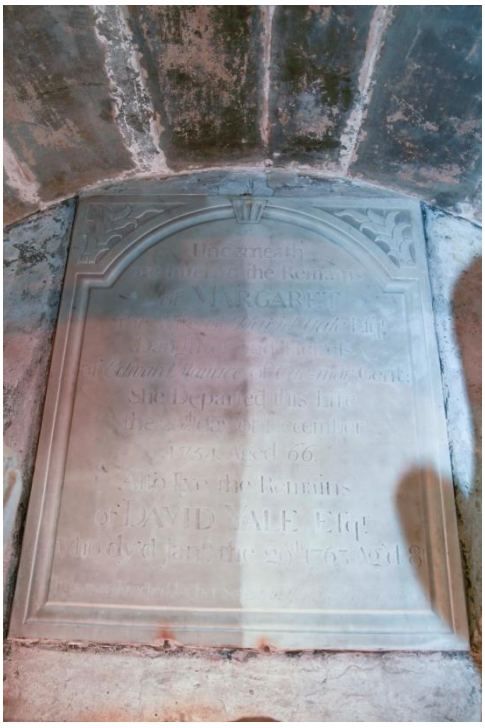
5.2.3 The rather crude, bare bulb lighting in the recess should be changed for a cold-source light (LED) and would hope new lighting proposals would come up with a more imaginative scheme. The warm bulb will elevate the temperature within the recess during winter months, if the church continues to be left open for the public and that light is turned on (by others) as it was daily for the duration of involvement with the monument. The impact of which will be determined during the winter, when we return to re-take all of the previous data.

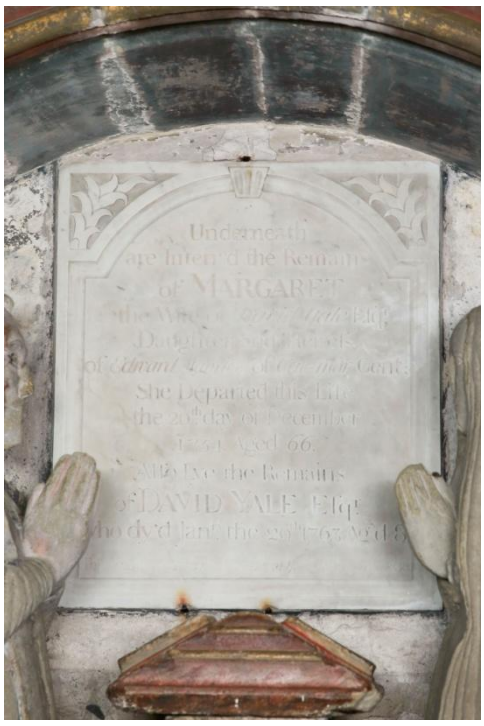
5.2.4 Elliott Ryder Conservation will monitor the condition of the monument (free of charge) after twelve months, as part of our on-going maintenance commitment, and report back to Mr Paul Crosby with any findings/observations.



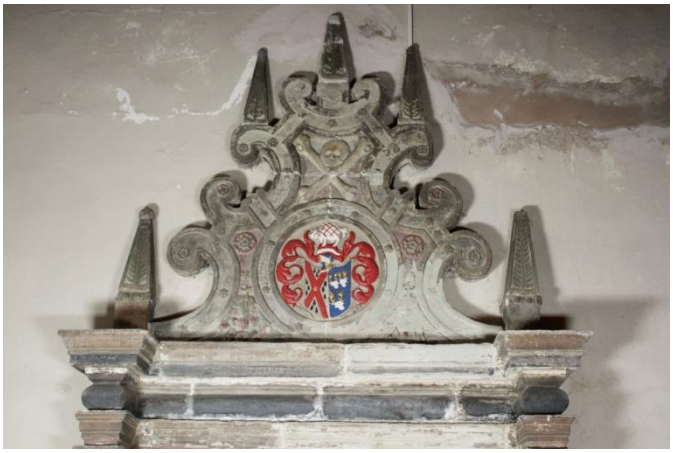


The Yale monument before and after all treatments (on the right). Note how the original intention of the designer is more apparent after cleaning, with the different warm colours more visible again, from ground-level. The images were taken with studio lights using daylight simulation tubes. All images have been colour-balanced to white.

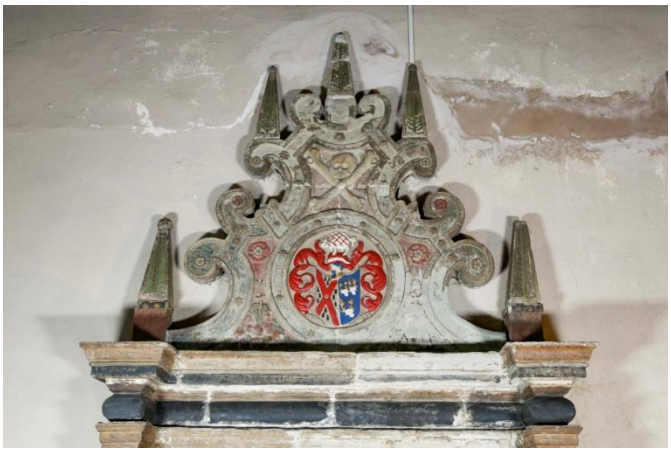




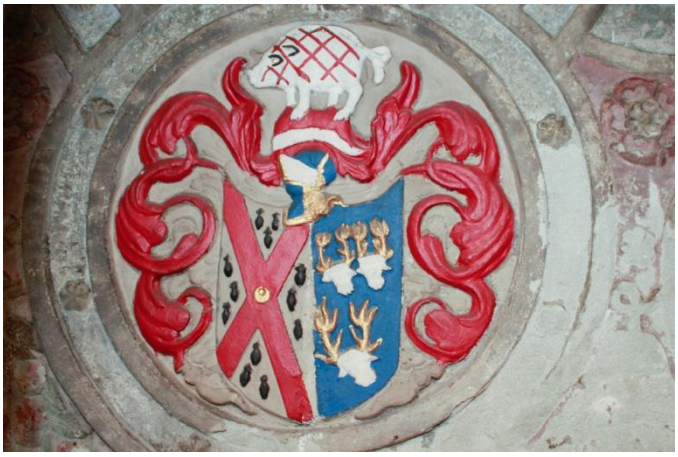
The later, lightly-incised, marble dedication panel in the recess, during and after cleaning. The marble responded well to a solvent mixture. It could have been taken much further and re-polished, but that approach is inappropriate, choosing instead a light-general clean. Note the top of the lectern between the two kneeling figures is completely cleaned in this image, revealing the crude marbling to the painted, carved sandstone.



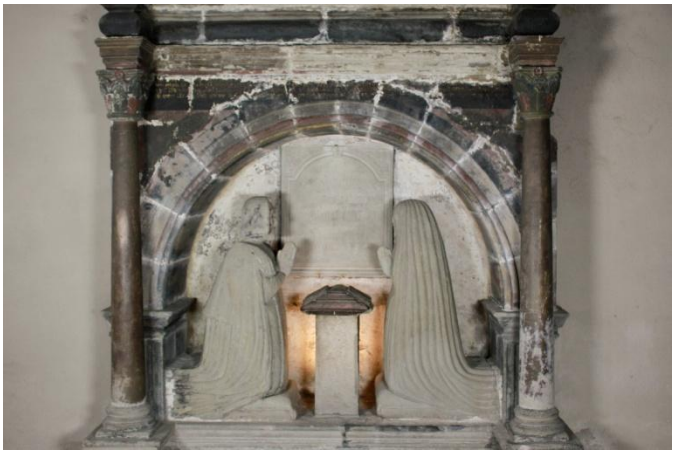
The florid embellishments surrounding the coat of arms, appear uniformly dirty before conservation, with no sign of the delicate painting to the floral and foliate detailing, which is all but lost visually.



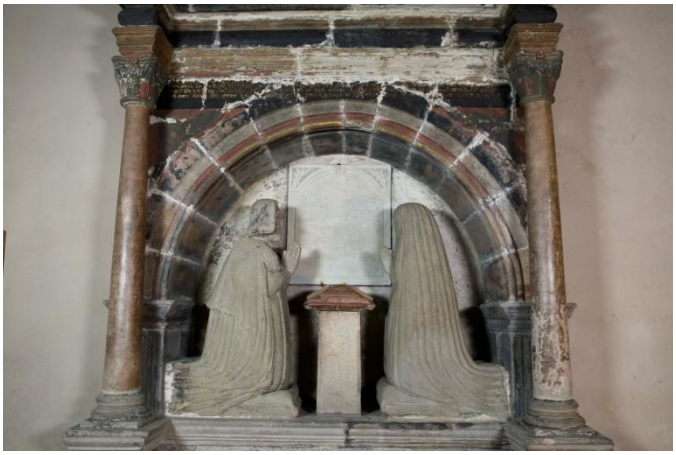
After conservation, the vertical four pinnacles display their green decoration, with supposedly red marble bases. Presumably the painters had seen red marble –which would have been prohibitively expensive, even for such an elaborate monument.



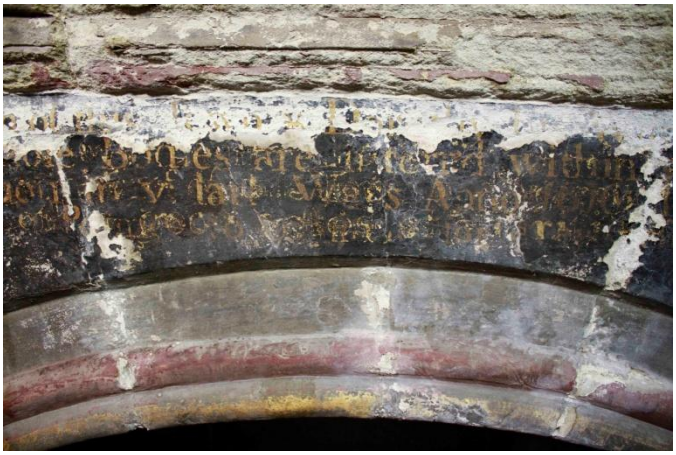
The now crudely, oil-painted heraldry, at odds with the delicate decoration visible over the remainder of the monument.



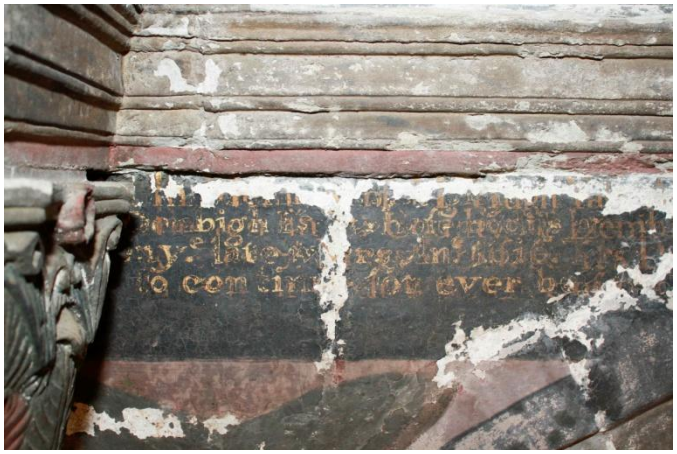
The arched recess, depicting the kneeling couple. Note the warm filament-bulb will be raising the temperature within the recess enough to likely contribute to the loss of surface-polish to the marble from repeated heating/cooling cycles. Strong consideration should be given to replacing it with cold-source lighting, during the planned re-display / interpretation of the monument.



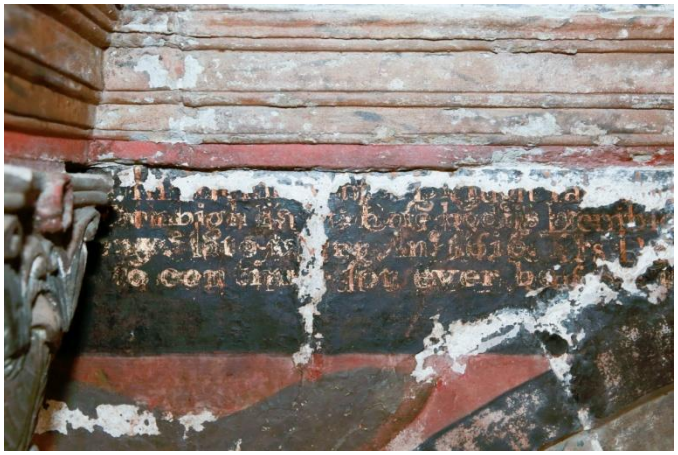
The arch elements and overlying moulded cornice after all treatments. It might also be a good idea to incorporate an information panel nearby, detailing whom the monument commemorates. Note the colours on the supposedly marble lectern top, between the figures.



A detail of the concentrated damage caused by efflorescence (soluble-salt activity). Liquid consolidant was injected along the paint edges, which is drawn down behind and along the flakes by capillary action, ensuring the paint is secured back to the substrate when the solvent carrier has evaporated. The arch is yet to be cleaned but the flatwork is painted to give the appearance of green marble, with red and gilded mouldings beneath.



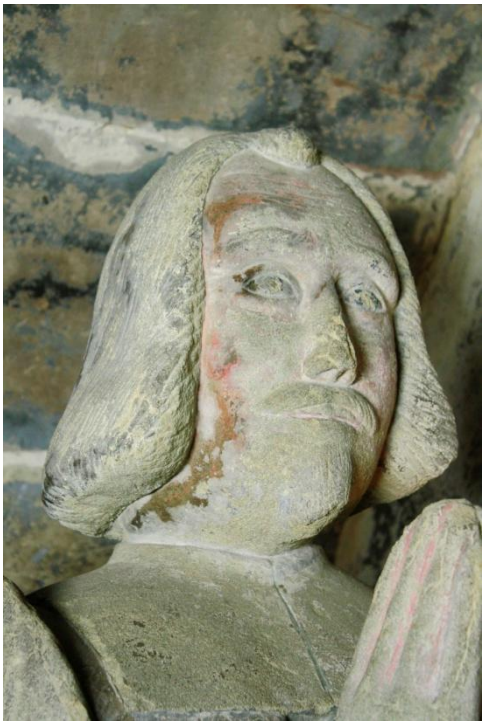
The moulded horizontal entablature and spandrel beneath complete with oil-gilded dedication. The white areas of loss are where the mortar joints (the path of least resistance) have been disrupted historically, by efflorescence.

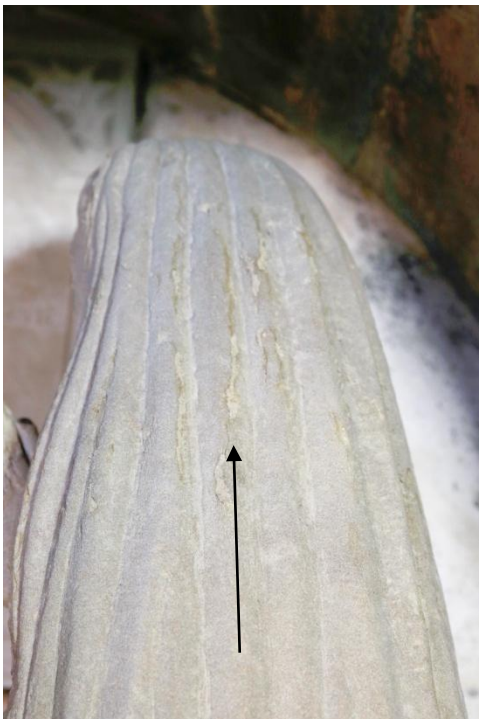


The same area after detailed cleaning - using separate materials on the painted marbling and the drying oil beneath the gilding. With all paint edges having been consolidated to ensure their physical integrity once again, now the external factors leading to chronic efflorescence have been addressed.

A detail of the two separate layers of oil-gilding over a black pigment in a drying-oil binder. The dedications are off-set and it is not clear why, making the dedication extremely difficult to read in places.

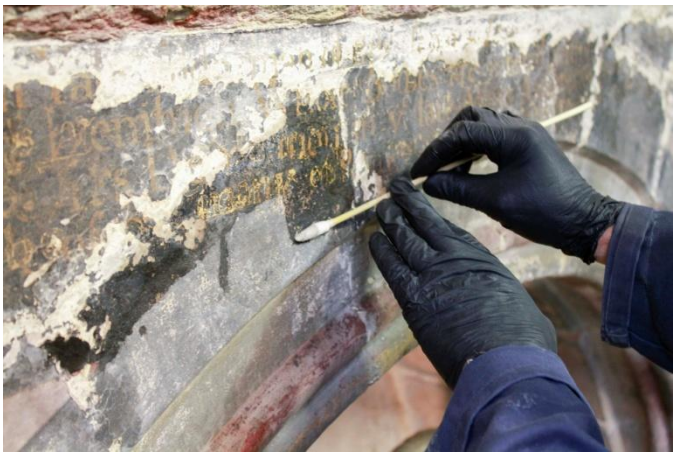
The male kneeler thought to be Mr Hugh Yale opposite the female, thought to be his wife, Dorothy Yale. Between them is a crudely tooled lectern-base and marble top, all carved from sandstone, with the upper element decorated to give the appearance of marble, complete with a book on each sloping side facing the kneelers.



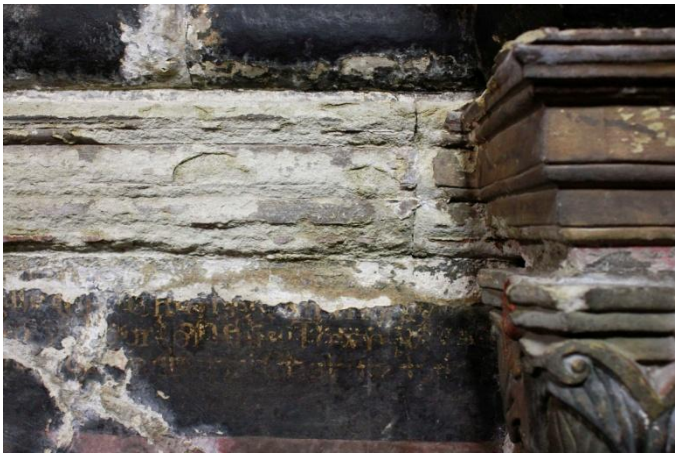


Painted flesh-tones can still be seen on the face and chin of Hugh Yale, in what would appear to be a concerted effort to remove all traces of applied decoration, with such decoration not deteriorating so uniformly. The striations in the vertical drapery folds of Dorothy Yale were at the stage prior to serious delamination and had liquid consolidant applied by pipette until a consolidative affect was achieved. Any excess consolidant on surfaces were then swabbed with Acetone to remove residual darkening.

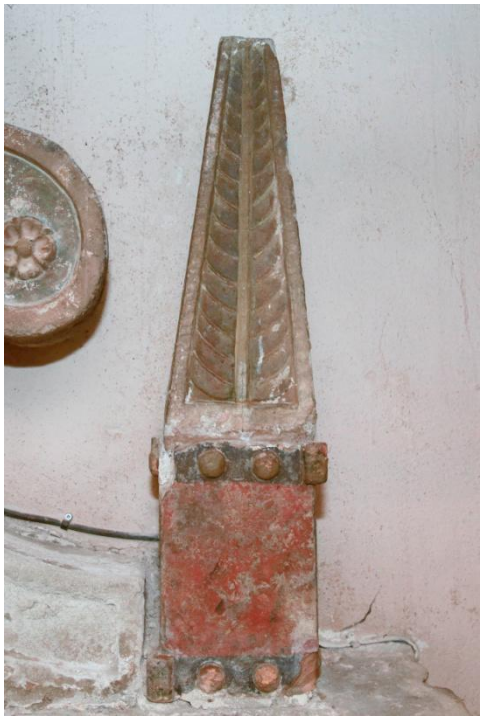
Solubility and cleaning trials to the oxidised black paint above the moulded entablature. Airborne dirt becomes almost fused onto surfaces by a number of factors such as : elevated humidity in that area of the building; photo-degradation from direct sunlight and the heating/cooling from the warm-source within the recess, albeit it at lower level.



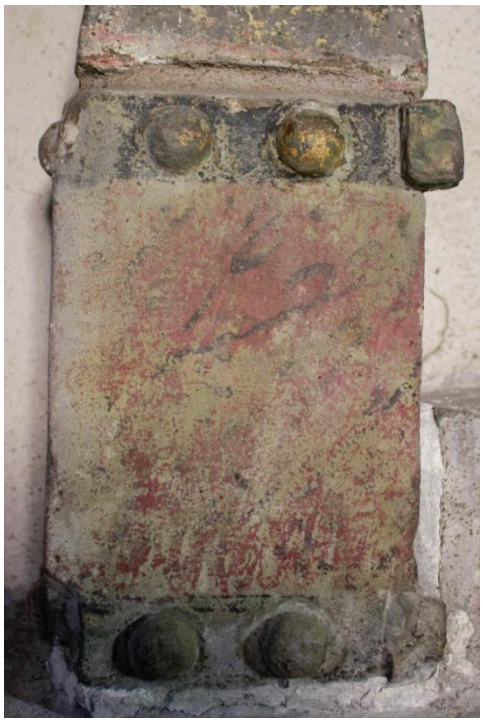
The safest and most suitable solvent (determined after trials) rolled over the surface in the majority of areas with cotton-wool swabs, as the decorated surfaces were not up-to circular rubbing with cotton-wool, such was the fragility of the aged paints.

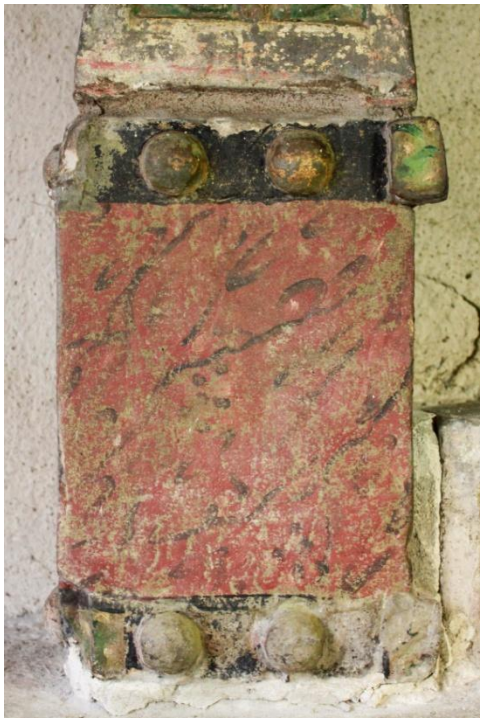


Efflorescence was concentrated in a horizontal zone 3 – 4 metres above finished-floor level. It is most likely attributed to horizontally penetrating, excess moisture in the external pointing at that level, but it should not be forgotten that sandstone is a natural material and individual blocks could have been contaminated prior to quarrying, carving and fixing/building the monument.

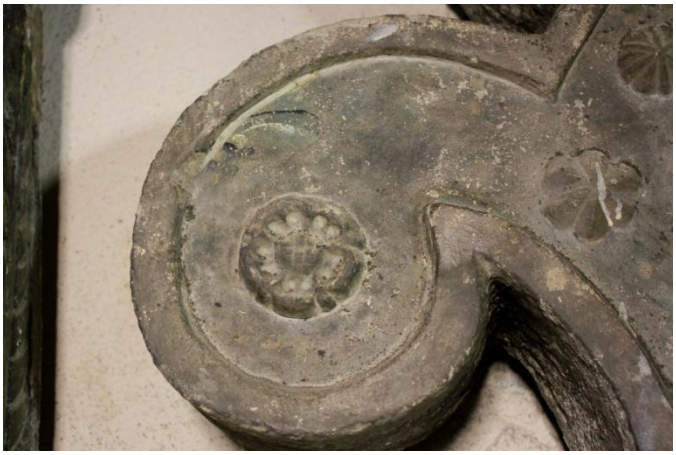


The viewer’s right-hand pinnacle at entablature level, before and after cleaning. Note the delicately applied, green decoration is not apparent before conservation and will be difficult to establish from floor-level, with the current ambient lighting. Note also the black horizontal banding complete with gilded spherical domes above and below the red marbling, complete with black veining.

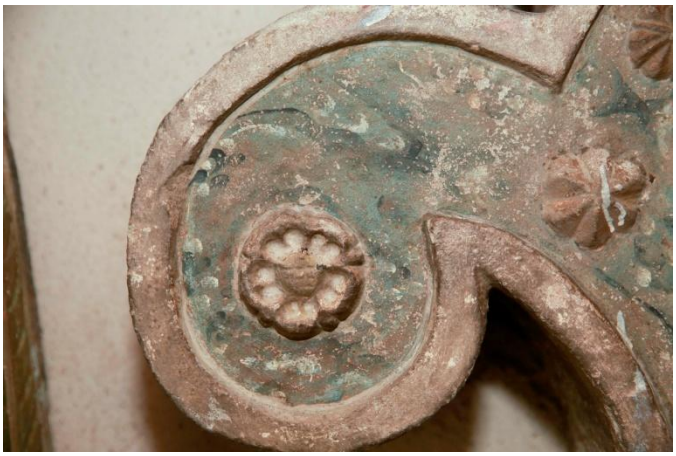




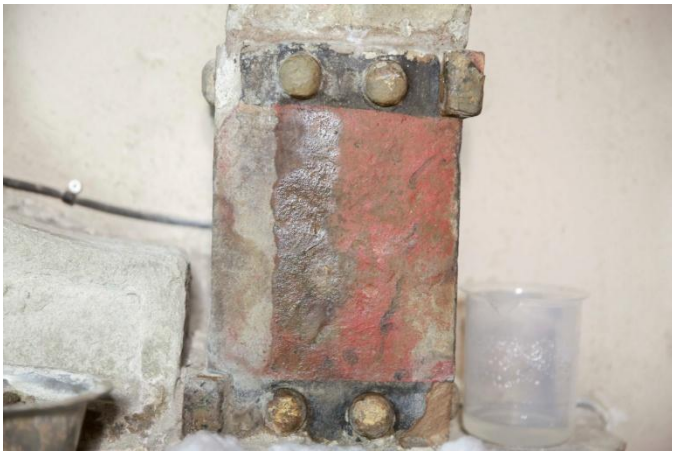
The marbling with black veining (as in real marble) is more apparent after cleaning, as is the oil-gilding, which highlights the extent of care and cost lavished on an otherwise more humble sandstone monument.



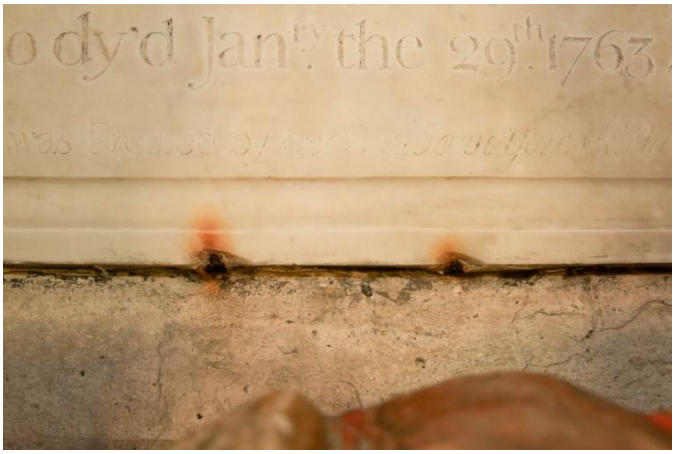
One of the proper left-hand curlicues or embellishments, surrounding the coat of arms - with a supposedly green marble panel (Connemara is the only geologically true marble in the UK) representing its characteristic, inherent black and white veining.



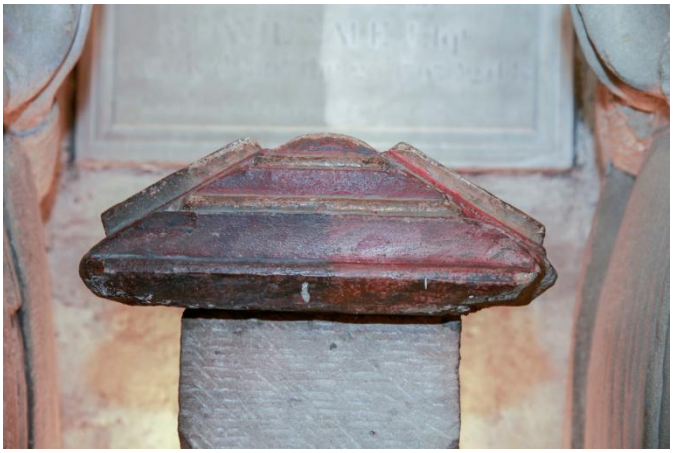
The delicate, fragmentary remains of largely green painted marbling. The high-relief, white rosette is more pronounced after detailed cleaning with cotton-wool swabs. There was no point applying the best consolidant currently available, over all painted remains, largely because ambient conditions within the building are much more favourable and everything (even stable consolidants) degrade.



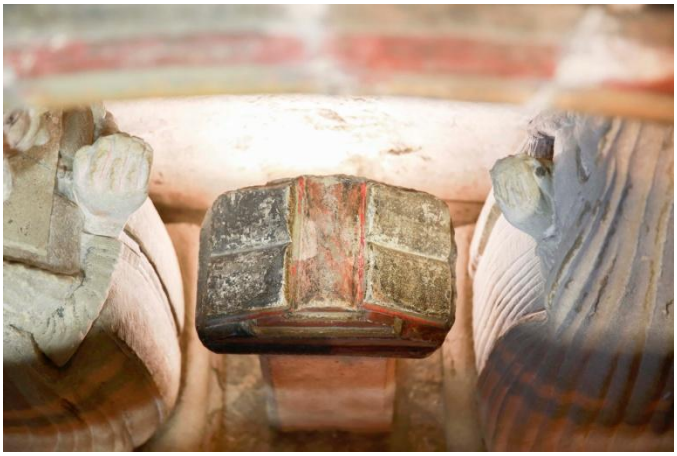
Cleaning in progress to one elevation of the overlying pinnacle base. There is an error in building this pinnacle, in that only three of the four elevations are decorated (presumably to save money). The undecorated side should be facing into the wall and so unseen, but instead faces out into the nave and as such, is part of the history/development of the object.



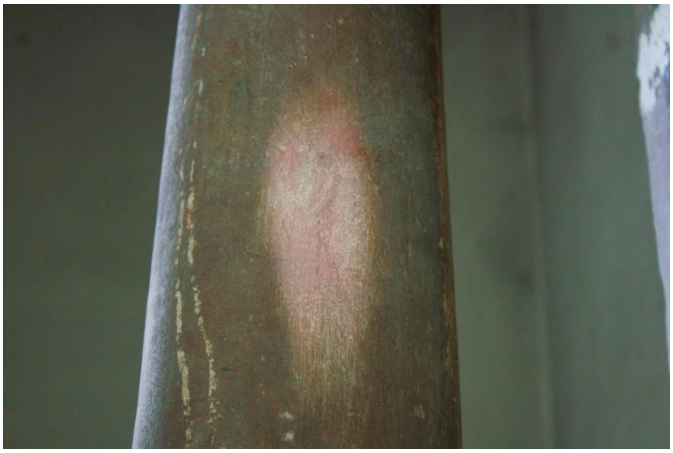
The pair of load-bearing fixings in the bottom bed of the later marble dedication panel, have corroded (due to excess moisture) causing spalling of the marble arriss, as the iron corroded. The exposed iron was abraded with a polishing-mop, treated with two applications of corrosion inhibitor, followed by a single protective coat of acrylic resin. Removing and replacing the fixings with stainless-steel would have caused avoidable damage to the surrounding plaster fillet and the likely integrity of the panel.



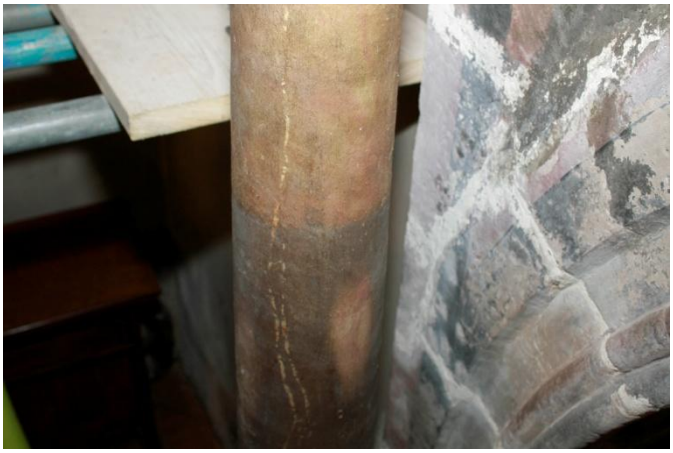
Cleaning in progress to the marble dedication panel in the background and the right-hand side of the marbled lectern top, in the foreground.



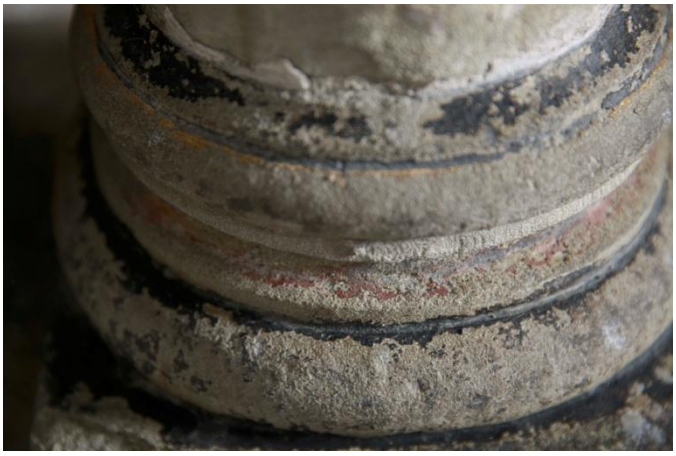
Cleaning in progress to the top of the lectern (right-hand side) complete with the painted books either side of the centre. The decorators even applied marbling to the top of the lectern, which will never be seen.



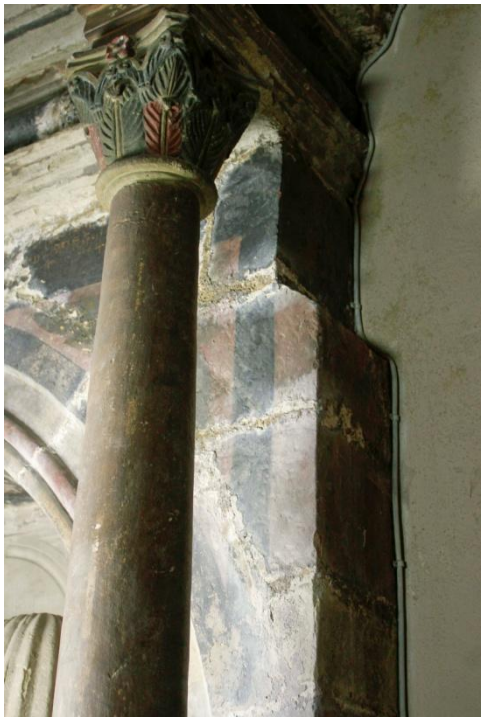
A previous, crude attempt at cleaning, that has scratched or removed the surface of the paint when viewed under magnification. It does however, highlight the delicate nature of the applied decoration.

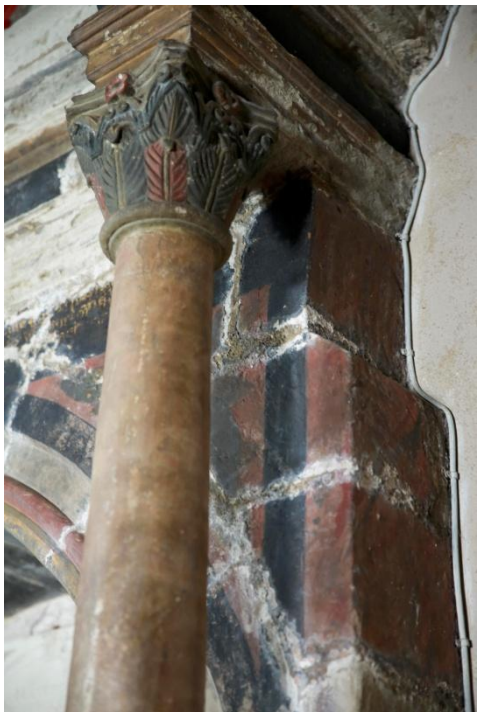


Cleaning in progress to the left-hand column. This was carried out using a weak liquid-soap solution, applied with small blocks of close-cell foam. Once cleaned you can appreciate more fully the intention of the designer and skill of the painter(s).

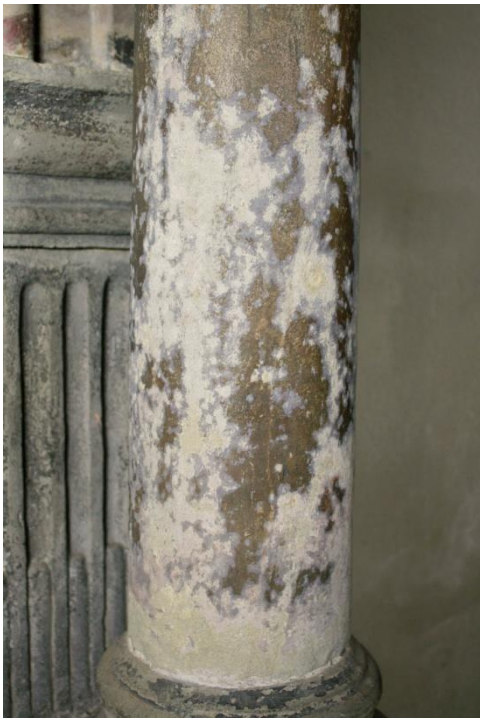


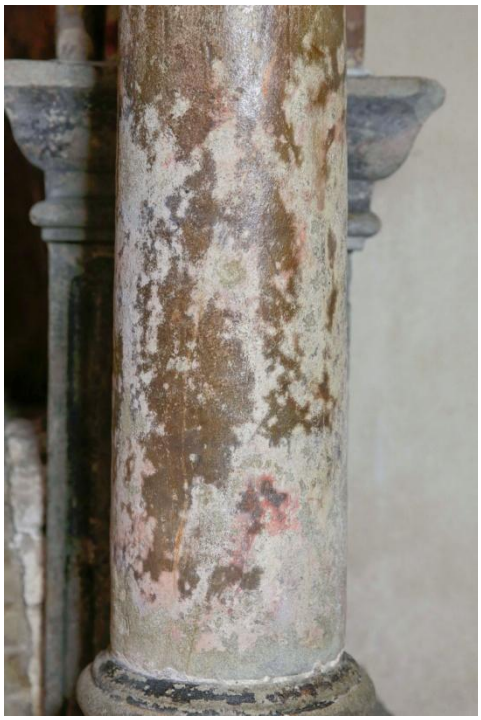
The well-adhered, fragmentary remains of applied decoration to one of the column bases, hinting at the exuberant, original : black; gilded; red and black decoration from top to bottom. The exposed sandstone is in a sound condition, indicating the decoration appears to have been removed intentionally.



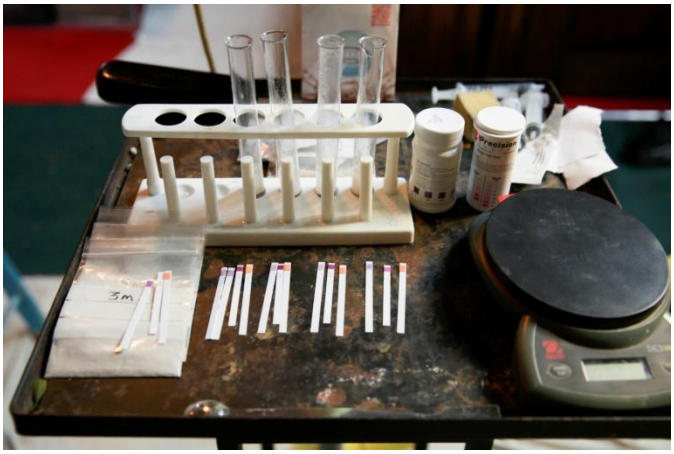


The right-hand column and spandrel (behind) before and after cleaning. Note the thick, vertical black-line looks like a shadow, but has been painted intentionally. The marbling to the column would have looked realistic when first applied (before deterioration) and only looks obvious now, due to the loss of paint at the bottom, exposing the sandstone beneath.





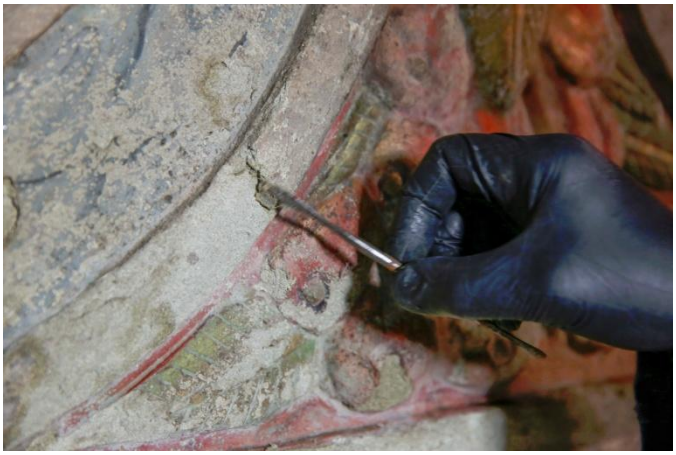
The extent of deterioration to the bottom of the right-hand column. Loss has been caused by physical wear being at low-level, likely - intentional over-cleaning, and the effects of efflorescence. Note how the cleaning process has imparted a degree of lustre, back to the degraded, aged paint.



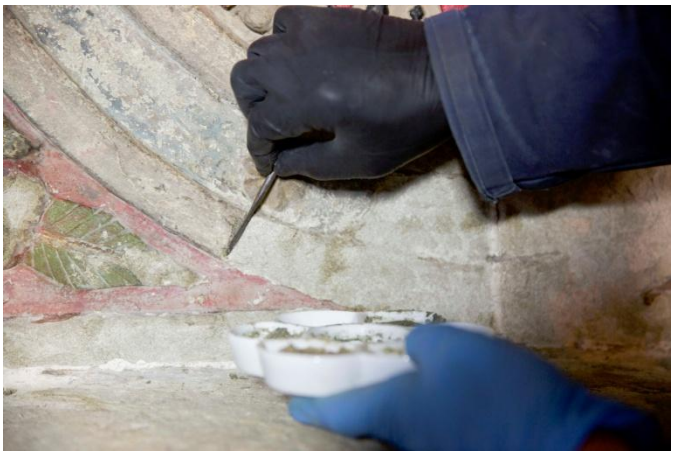
Salt analyses of adjacent wall-plaster - testing for different salt-types and their concentrations. This was undertaken to each of the drilling locations from floor to ceiling. Sampling was consistent, with each sample – with the same weight, dissolved in the same volume of de-ionised water for the same time period - to give consistent, repeatable results.

Efflorescence in the form of salt pustules just below wall-plate level and above the monument. These localised growths of soluble-salts are capable of forcing off non-permeable paint, as salts crystallise at the intersection between the permeable bare plaster and impermeable overlying paint layer(s).

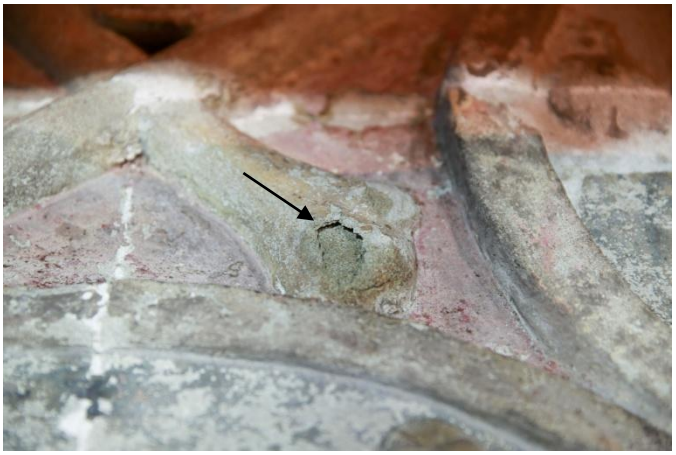
Soluble salts exert significant forces on a microscopic level and can cause even the hardest sedimentary stones to disaggregate (lose physical cohesion) particularly arrisses/edges – areas of greatest evaporation, such as in this image. The source of salts on this monument is inconclusive but the chronic deterioration is concentrated over a relatively small area.



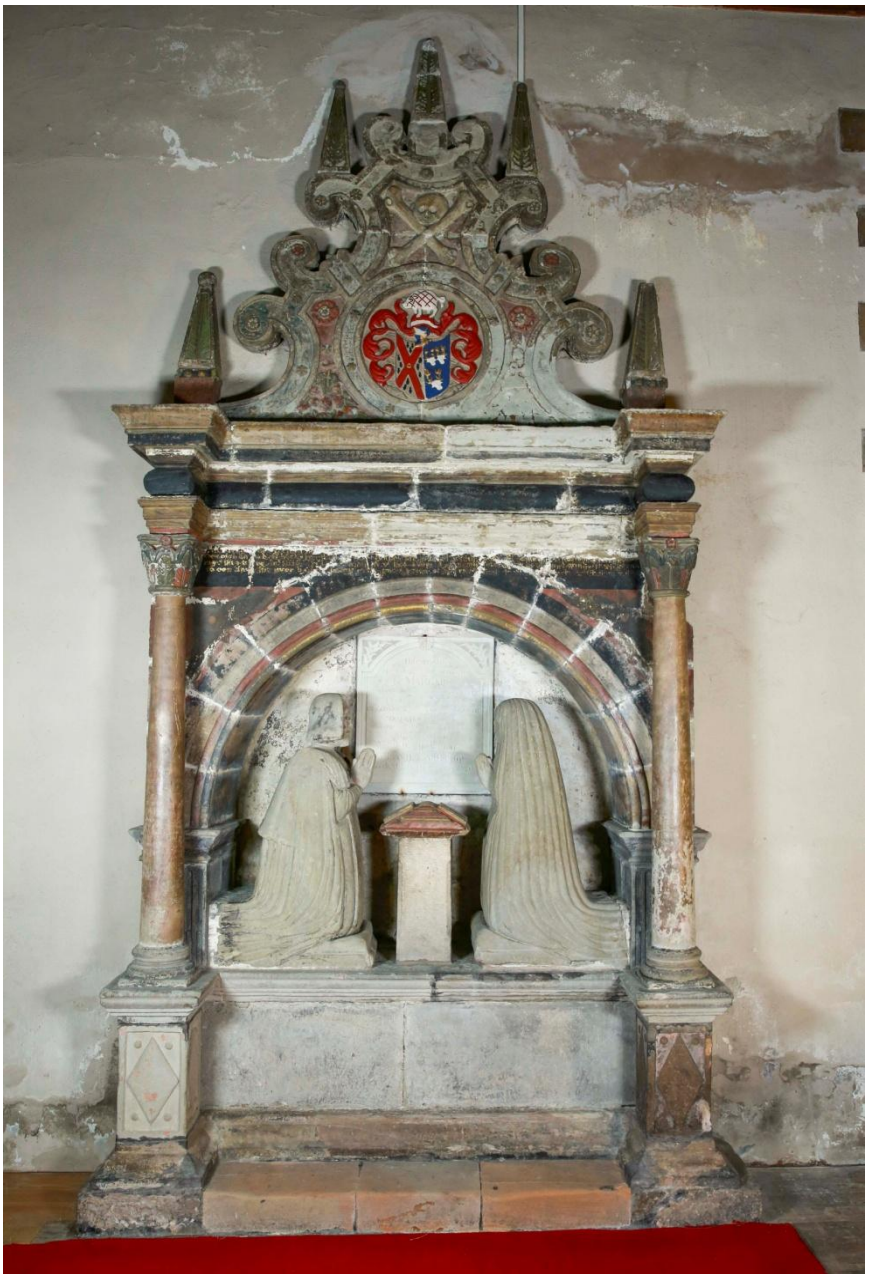
Support fillings made of crushed/sieved sandstone dust and/or sand - mixed with a 10% solution of acrylic-resin being inserted into and behind vulnerable edges. These areas had been surface consolidated beforehand, with two cycles of a weaker solution of Paraloid B72. The areas were allowed to give-off the solvent-carrier, before support fillings were introduced.



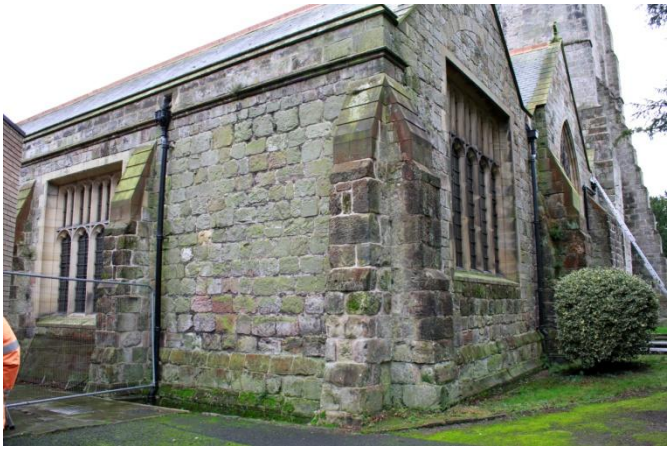
The majority of support fillings were applied to the decoration beneath the coat of arms and a zone of the right-hand cornice and entablature, as well as other isolated areas. Stone is a natural material of course and can deteriorate in a random manner, next to an area of completely healthy adjacent stone.



Vulnerable areas such as this, where there is a real risk of losing carved upper-surface were consolidated and then packed with the filling-medium, coloured to blend-in with adjacent, sound stone. No attempt was made to replicate or suggest missing carved detail. The fillings are easily reversible in Acetone, unlike lime mortars which would be harder than the weakened stone under repair and as such have no place on this type of stone or delicate carving.

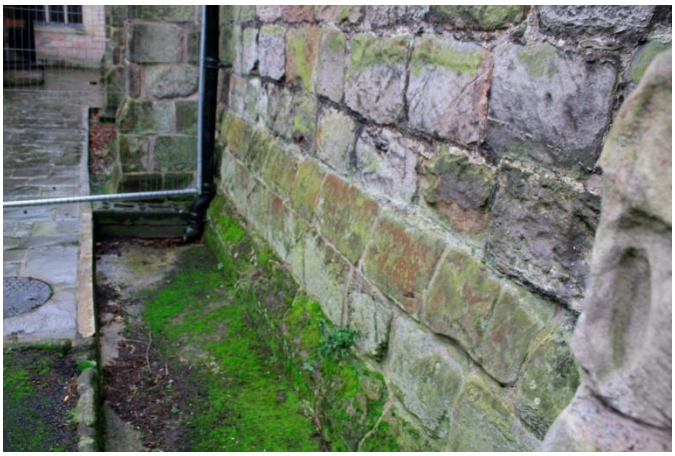


The Yale monument after all treatments, with the original palette of colours more obvious once again, despite the intervening 400 plus years. Note the historic damp/deterioration zones above the monument, due largely to the historic faulty/ineffective rainwater removal from the overlying parapet and other rainwater goods, which have been addressed relatively recently. This image is captured with strong studio-lights, incorporating daylight simulation tubes. The current, ambient lighting arrangements are known not to illuminate this culturally important object effectively. It would certainly benefit significantly from the planned, sensitive lighting scheme, taking into account the amount of surviving polychromy. The adjacent tracery window to the south would provide additional light levels (free of charge) in this area of the church, just from being vacuumed carefully, whilst being mindful of enhanced Lux (light) levels as outlined in the report.



The external location of the monument, which is situated between both buttresses – extending just beyond the viewers left-hand buttress. The faulty (presumably lead-detailed covering) parapet which overlies the monument inside, was rectified several years ago. The legacy of it being defective can still be seen over the internal plaster at high level, as outlined in the report.

Plants were seen issuing from joints (indicated) above the horizontal string course and the overlying coping stone, during our initial survey. These were removed recently (by others) and pointed to stop the ingress of moisture into those entry points. The pointing to the walling immediately behind the monument appears to be in relatively good order, but should be monitored to ensure its integrity. .



Well-established moss on the lower flared plinth (shed onto it by the string-course above) and the concrete gulley, both indicate a prolonged problem of excess moisture, which moss retains on the surface of stone, enabling it to migrate horizontally into the fabric. This should be removed on an annual basis, if only to prevent the drain in the background, at the foot of the down-pipe from blocking with biological material. Sediment is visible in the new concrete gulley indicating this is already an issue that needs addressing.

List of Materials and Suppliers

Material	Supplier	Address	Contact Number
Scaffold Access	Oswestry Scaffolding Ltd	Oswestry Scaffolding Ltd 10 Jennings Road Oswestry Shropshire SY11 1RU	01691 656178
Semi-quantative Test Strips Chlorides Sulphates Nitrates/Nitrites	Simplex Health	27-37 Eastfield Road Wollaston NOTTINGHAMSHIRE NN29 7RS	01933 664746
Calcium Carbide Re-agent	Merlin Lazer Ltd	Weald House High Broom Lane CROWBOROUGH East Sussex TN6 3SP	01892 886108
De-ionised Water Jenolite (Corrosion Inhibitor)	Motorworld	Teify Garage Cwmann Lampeter CEREDIGION SA48 8JN	01570 423296
Vulpex Ammonia Solution Synperonic A7 Paraloid B72 Close-cell Sponge	Conservation Resources	Units 1, 2 & 4 Pony Road Horspath Ind Estate Cowley OXFORDSHIRE OX4 2RD	01865 747755
Industrial Methylated Spirits Acetone	Brand Chemicals	Thomas Street Blackpool LANCASHIRE FY1 3HG	0333 800 2345
Cotton Wool	Claytons First Aid Ltd	Chiddingstone Causeway Tonbridge KENT TN11 8JP	01892 871111