

Ancient Monuments Laboratory
Report 33/97

WALL PAINTING CONDITION AUDIT,
CHESTER CASTLE, CHESHIRE

T Manning
S Stewart

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Summary

This condition audit of wall paintings at Chester Castle includes a wall painting record, general audit information, documentation of original materials and execution of the painting, and deterioration and damage including previously used materials and treatment, as well as proposals for treatment and monitoring strategies.

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Chester Castle

Cheshire

The following report has been generated by the Wall Painting Section database. This archival system provides a computerised record of all wall paintings in English Heritage Historic Properties and is intended to comprehensively document the collection. Each report has been subdivided into four sections to present the data in a clear format. These include:

1 Wall Painting Record:

Includes a description of the site and paintings, as well as archival information, such as bibliographic references and photographic records.

2 General Audit Information:

Describes any monitoring undertaken and a synopsis of future conservation requirements.

3 Technique:

Documents the nature and condition of the original materials and execution of the painting which is described according to its stratigraphy and any related analysis.

4 Deterioration and damage, added materials, treatment:

Deterioration and damage lists the types of alterations which may have occurred, that is either deterioration (natural alterations such as cracking or delamination) or mechanical damage (such as graffiti).

Added Materials documents all non-original materials present on or within a painting. These may include naturally occurring substances (accretions, such as dirt and dust) or deliberately added materials (coatings, coverings and repairs).

Treatment documents previous interventions and proposed treatment and monitoring strategies.

Throughout each section, an area of painting is assigned a number between 1 and 4 which is intended as a general indication of present condition. These are: 1 good, 2 fair, 3 poor, 4 unacceptable.

This report is based on information gathered prior to March 1996 and does not include any changes in condition, further research or treatment undertaken after this date. Amended editions will be produced as necessary.

1 Wall Painting Record

Property name	CHESTER CASTLE		
Region	North	County	Cheshire
Location of painting	Chapel of St Mary de Castro, first floor, Agricola Tower		
Orientation	VAULTS AND WALLS, E, W, N, AND S		
Century 13 th	Date	Height (cm) 0	Width (cm) 0

Subjects included

Adoration of the Magi

Angel(s)

Figurative

Foliate scrollwork

Inscription(s)

Quatrefoil(s)

Roundel(s)

Unidentified scene

Virgin Miracle scenes

Description

The chapel

The chapel of St. Mary, which is used as the private chapel of the Cheshire Regiment, is located on the first floor of the Agricola Tower, in the inner bailey of Chester Castle. The building is constructed of a local red sandstone, with many later additions and alterations. The architectural details of the interior, ie. the capitals, bases and door mouldings, 'together with the general design and character of the tower as a whole, point towards a transitional construction in the late 12th or early 13th century, so certainly under the patronage of Earl Ranulf III (1187-1232). The closest stylistic parallels for the architecture of the chapel are provided, interestingly enough, by the two great Chester abbeys of St John, and the Cathedral.' [Babington and Welford 1993]

'The chapel is a parallelogram in shape, measuring 19 ft. 4 in. in length, and averaging in breadth 16ft 6in. The height to the apex of the groining is 16ft 6in. It is divided into two bays by quadripartite, acutely-pointed, stone vaulting, with an extra rib between each bay. The ribs are massive and beautifully moulded with three filleted rolls and an intermediate angular member springing from circular vaulting shafts, with floriated and voluted capitals, and moulded base. The shafts are about 4ft 6in. in height and with the caps, collars, and base, 7ft 5in. There are three vaulting shafts on the west side, and two -- one at either end -- on the east side...

The pointed doorway has a keel mould on the edge, and is in the first bay on the south-east side. The altar, at the north east end, is recessed in the thickness of the wall, with a segmental arch over it. Its dimensions are: 5ft. 0in. in height, 5ft 6in. wide, and recessed 2ft 1in. Above the altar is a deeply splayed square light, measuring 4ft 6in. by 5ft 6in. To the right, and on a level with the altar, is a small aumbry with round head, measuring 1ft. 8in. by 1ft. 1in., and 10 in. deep. At the opposite end of the room (south) is a pointed recess in the thickness of the wall...In the upper part is a modern window, ...and in the lower part are two stone seats, one on either side....' [from Simpson 1925]

It should also be noted that the original entrance to the chapel probably would have been by a private passage from the adjacent block of buildings (now lost). 'On the landing just outside the chapel, and on a similar level, below a wall of masonry, signs of a stone step were seen. An opening was made near the top of the wall, and eventually the wall was taken down. It was then seen that this wall had blocked up a short passage about 5ft. 0in. in length, when it turned through the south-east wall of the tower. The ceiling is

groined with rubble stone plastered over... This is undoubtedly the passage mentioned in an early record as leading from the Governor's house to the chapel, but which in course of time had been entirely lost sight of.' [from Simpson 1925]

The dating of the paintings proves slightly more difficult. The castle was taken over by Henry III in 1237 on the death of the last Earl of Chester, and the chapel could have been redecorated at this time. However, as the chapel dates from the late 12th century, the paintings could be earlier. Stylistic comparison with illuminated manuscripts of the period suggests that the style of the paintings is closer to c.1220. The paintings would then date from the time of Earl Rannulf III, making it an important baronial scheme instead of a royal one.

The paintings

'The fragmentary nature of the surviving paintings in St Mary de Castro have naturally made the identification of schemes difficult, and whilst some preliminary conclusions regarding the iconographic programme have been reached, these must be regarded as provisional. What is however apparent is that the subject-matter on the vault and that depicted in the wall spaces are unrelated, though both, confirming the medieval dedication, are broadly speaking Marian. The wall spaces were painted in three tiers, the lower of which seems to have consisted of dado draperies. The wall of each bay contained a narrative divided into the two remaining tiers, and framed round the arched tip by a band of decorative painting. This varies throughout the walls, and includes a meander, bent-ribbon and scroll-work designs.... Traces of polychromy also appear on most of the vault ribs, and clearly show that originally they were painted to imitate marble.' [from Babington and Welford 1993]

The walls appear to have been painted with a Miracles of the Virgin series, of which the legends of Theophilus, Ebbo the Thief, and the Virgin and the Beggar have all been tentatively identified. A programme devoted to the Virgin, particularly where she is shown as an intercessor for individual sinners, is a suitable subject for a private chapel, and 'is in marked contrast to the standard subject-matter of saints' martyrdoms, Christological cycles, and the Last Judgement, commonly found in thirteenth-century wall paintings elsewhere.' (Babington and Park 1993)

The vault appears to have been decorated with a scheme showing the Infancy of Christ, a subject befitting a chapel devoted to the Virgin. These scenes have been set within frames and surrounded by foliage, a popular format for vault paintings, as can be seen in other high-quality schemes at Canterbury and Winchester cathedrals.

The paintings were largely destroyed during the 17th, 18th and 19th centuries, when the building was used as a magazine, and various storage cupboards were attached to the walls. However, much of the painted plaster still survived, and a drawing from 1810 (by Musgrove, a local artist) shows more substantial remains of painting. The paintings were forgotten for another century, when, in the 1920s, they were uncovered from several layers of 'yellow wash'. This was documented by F. Simpson (1925) in his booklet published at the time. Yet again, the paintings were forgotten and even Tristram's survey of 1955 only mentions that 'traces of scroll ornament in red, with leaf terminals survived on the vaulting in 1937'. In 1992, the decorative scheme was re-discovered once more, albeit obscured under a fine calcite veil, by members of the Courtauld Institute and English Heritage. The investigation of the paintings then became a joint English Heritage/Courtauld Institute of Art project from 1992-1994.

Photographic Record

29/6/94 EH 'current' contact photo files; Agricola Tower, wall painting detail, during cons, July 1992, K920054, K920051. (As published in newspapers?).

EH photo library, computer keyword search;

Post-conservation, July 1993; A931095 (cross-refs; E930323,M931342,J930488), A931096 (cross-refs; E930324,M931343), A931097(cross-refs; E930325), A931098(cross-refs; E930326,M931344), A931099(cross-refs; E930327,M931345), A931100(cross-refs; E930329,M931347), A931101(cross-refs; E930330,M931348), A931102(cross-refs; E930331), A931103(cross-refs; E930332,M931349), A931104(cross-refs; E930333,M931350). B935409 (cross-ref; F930748, M931353), B935410 (cross-ref; F930749, M931354), B935411 (cross-ref; F930750, M931355), B935412 (cross-ref; F930751, M931356), B935413 (cross-ref; F930752, M931357), B935414 (cross-ref; F930753, M931358), B935415

(cross-ref; F930754), B935416 (cross-ref; F930755, M931359), B935417 (cross-ref; F930756, M931360), B935418 (cross-ref; F930757, M931361), B935419 (cross-ref; F930758, M931362), B935420 (cross-ref; F930759, M931363), B935421 (cross-ref; F930760, M931364), B935422 (cross-ref; F930761), B935423 (cross-ref; F930762), B935424 (cross-ref; F930763, M931365), B935425 (cross-ref; F930764, M931366), B935426 (cross-ref; F930765), B935427 (cross-ref; F930766, M931367), B935475. E930323 (cross-refs; A931095, M931342, J930488), E930324 (cross-refs; A931096, M931343), E930325 (cross-refs; A931097), E930326 (cross-refs; A931098, M931344), E930327 (cross-refs; A931099, M931345), E930328 (cross-refs; M931346), E930329 (cross-refs; A931100, M931347), E930330 (cross-refs; A931101, M931348), E930331 (cross-refs; A931102), E930332 (cross-refs; A931103, M931349), E930333 (cross-refs; A931104, M931350). F930748 (cross-refs; B935409, M931353), F930749 (cross-refs; B935410, M931354), F930750 (cross-refs; B935411, M931355), F930751 (cross-refs; B935412, M931356), F930752 (cross-refs; B935413, M931357), F930753 (cross-refs; B935414, M931358), F930754 (cross-refs; B935415), F930755 (cross-refs; B935416, M931359), F930756 (cross-refs; B935417, M931360), F930757 (cross-refs; B935418, M931361), F930758 (cross-refs; B935419, M931362), F930759 (cross-refs; B935420, M931363), F930760 (cross-refs; B935421, M931364), F930761 (cross-refs; B935422), F930762 (cross-refs; B935423), F930763 (cross-refs; B935424, M931365), F930764 (cross-refs; B935425, M931366), F930765 (cross-refs; B935426), F930766 (cross-refs; B935427, M931367), F930767 (cross-refs; M931368). J930488 (cross-refs; A931095, M931342, E930323). July 1993; M931342 (cross-refs; A931095, E930323, J930488), M931343 (cross-refs; A931096, E930324), M931344 (cross-refs; A931098, E930326), M931345 (cross-refs; A931099, E930327), M931346 (cross-refs; E930328), M931347 (cross-refs; A931100, E930329), M931348 (cross-refs; A931101, E930330), M931349 (cross-refs; A931103, E930332), M931350 (cross-refs; A931104, E930333), M931351, M931352, M931353 (cross-refs; B935409, F930748), M931354 (cross-refs; B9354010, F930749), M931355 (cross-refs; B935411, F930750), M931356 (cross-refs; B935412, F930751), M931357 (cross-refs; B935413, F930752), M931358 (cross-refs; B935414, F930753), M931359 (cross-refs; B935416, F930755), M931360 (cross-refs; B935417, F930756), M931361 (cross-refs; B935418, F930757), M931362 (cross-refs; B935419, F930758), M931363 (cross-refs; B935420, F930759), M931364 (cross-refs; B935421, F930760), M931365 (cross-refs; B935424, F930763), M931366 (cross-refs; B935425, F930764), M931367 (cross-refs; B935427, F930766), M931368 (cross-refs; F930767), M931369.

Pre-conservation; B923441(cross-refs; F920178), B923442(cross-refs; F920179), B923443(cross-refs; F920180), B923444(cross-refs; F920181), B923445 (cross-refs; F920182), B923446 (cross-refs; F920183), B923447 (cross-refs; F920184), B923448 (cross-refs; F920185), B923449(cross-refs; F920186), B923450 (cross-refs; F920187), B923451(cross-refs; F920188), B923452 (cross-refs; F920189), B923453, B923454 (cross-refs; F920190), B923455 (cross-refs; F920191), B923456 (cross-refs; F920192), B923457 (cross-refs; F920201), B923458 (cross-refs; F920202), B923459 (cross-refs; F920204), B923460 (cross-refs; F920203), B923461 (cross-refs; F920197), B923462 (cross-refs; F920198), B923463, B923464 (cross-refs; F920200), B923465 (cross-refs; F920193), B923466 (cross-refs; F920194), B923467 (cross-refs; F920195), B923468 (cross-refs; F920196), B923469 (cross-refs; F920206), B923470 (cross-refs; F920205), B923471 (cross-refs; F920207), B923472, B923473, B923474, B923475, B923476, B923477, B923478, B923479, B923480, B923481 (cross-refs; F920216), B923482 (cross-refs; F920218), B923483 (cross-refs; F920219), B923484 (cross-refs; F920220), B923485 (cross-refs; F920221), B923486 (cross-refs; F920222), B923487 (cross-refs; F920223), B923488 (cross-refs; F920224), B923489 (cross-refs; F920225), B923490 (cross-refs; F920226). June 1992; F920178 (cross-refs; B923441), F920179 (cross-refs; B923442), F920180 (cross-refs; B923443), F920181 (cross-refs; B923444), F920182 (cross-refs; B923445), F920183 (cross-refs; B923446), F920184 (cross-refs; B923447), F920185 (cross-refs; B923448), F920186 (cross-refs; B923449), F920187 (cross-refs; B923450), F920188 (cross-refs; B923451), F920189 (cross-refs; B923452), F920190 (cross-refs; B923454), F920191 (cross-refs; B923455), F920192 (cross-refs; B923456), F920193 (cross-refs; B923465), F920194 (cross-refs; B923466), F920195 (cross-refs; B923467), F920196 (cross-refs; B923468), F920197 (cross-refs; B923461), F920198 (cross-refs; B923462), F920199, F920200 (cross-refs; B923464), F920201 (cross-refs; B923457), F920202 (cross-refs; B923458), F920203 (cross-refs; B923460), F920204 (cross-refs; B923459), F920205 (cross-refs; B923470), F920206 (cross-refs; B923469), F920207 (cross-refs; B923471), F920208, F920209, F920210, F920211, F920212, F920213, F920214, F920215, F920216 (cross-refs; B923481), F920217, F920218 (cross-refs; B923482), F920219 (cross-refs; B923483), F920220 (cross-refs; B923484), F920221 (cross-refs; B923485), F920222 (cross-refs; B923486), F920223 (cross-refs; B923487), F920224 (cross-refs; B923488), F920225 (cross-refs; B923489), F920226 (cross-refs; B923490). July 1992; F920264, F920265 (cross-refs; B923492), F920266 (cross-refs; B923493), F920267 (cross-refs; B923494), F920268 (cross-

refs;B923495), F920269 (cross-refs;B923496), F920270 (cross-refs;B923497), F920271 (cross-refs;B923498), F920272 (cross-refs;B923499), F920273 (cross-refs;B923500), F920274 (cross-refs;B923501), F920275 (cross-refs;B923502), F920276 (cross-refs;B923503), F920277 (cross-refs;B923504), F920278 (cross-refs;B923505), F920279 (cross-refs;B923506), F920280 (cross-refs;B923507), F920281 (cross-refs;B923508), F920282 (cross-refs;B923509), F920283 (cross-refs;B923510, K920053). June 1992, M923018, M923019, M923020, M923021, M923022, M923023, M923024, M923025, M923026, M923027, M923028, M923029, M923030, M923031, M923032, M923033, M923034, M923035, M923036, M923037, M923038, M923039, M923040, M923041, M923042, M923043, M923044, M923045, M923046, M923047, M923048, M923049, M923050, M923051, M923052, M923097.

During conservation, July 1992; B923491, B923492 (cross-refs; F920265), B923493 (cross-refs; F920266), B923494 (cross-refs; F920267), B923495 (cross-refs; F920268), B923496 (cross-refs; F920269), B923497 (cross-refs; F920270), B923498 (cross-refs; F920271), B923499 (cross-refs; F920272), B923500 (cross-refs; F920273), B923501 (cross-refs; F920274), B923502 (cross-refs; F920275), B923503 (cross-refs; F920276), B923504 (cross-refs; F920277), Conservators working, B923505 (cross-refs; F920278), Conservators working, B923506 (cross-refs; F920279), B923507 (cross-refs; F920280), B923508 (cross-refs; F920281), B923509 (cross-refs; F920282), B923510 (cross-refs; K920053, F920283), B923511 (cross-refs; K920054), B923512 (cross-refs; K920051). K920051 (cross-refs; B923512), K920052, K920053 (cross-refs; B923510, F920283), K920054 (cross-refs; B923511). M930688, M930689, M930690, M930691, M930692, M930693, M930694, M930695, M930696, M930697, M930698, M930699, M930700, M930701, M930702, M930703, M930704.

Photograph search, DOE files, EH photo library (JD24/03/95)
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2 General Audit Information

Property name	CHESTER CASTLE	County	Cheshire
Region	North		
Location	Chapel of St Mary de Castro, first floor, Agricola Tower		
Orientation	VAULTS AND WALLS, E, W, N, AND S		
Century 13th	Date	Height (cm) 0	Width (cm) 0
<u>Monitoring undertaken/in progress:</u>		Start Date 1/04/93	End Date 1/05/93
Comments			
Auditor(s)	SS, TM	Start date	29/08/95

Overall condition score **2**

Recommendations

The paintings in the Agricola Tower have been the focus of a conservation campaign in collaboration with the Courtauld Institute of Art, spanning 1992-1994. This included a full art historical study, technical analysis, uncovering of the paintings and minor repairs, as well as graphic and photographic documentation. During the August 1995 audit, the paintings were found to be in stable condition, and their presentation to the public is now a primary concern. However, there are a few outstanding points which could still be addressed before initiating a plan for the long-term maintenance of the paintings. These include:

(1) Fills/repairs: Some minor edge repairs are required to the north side of the east wall, upper tier. Two small losses in the repair plaster of the vaults should also be repaired. These are located in IBS and IBN.

(2) Structural repairs: There has been some concern on the part of Regimental Museum staff that the roof may be leaking. It is advisable to have this checked thoroughly as soon as possible.

(3) Uncovering: Further uncovering of certain areas (still obscured by a layer of limewash) is not absolutely necessary but can be considered an option. This refers specifically to the altar recess, north reveal, where a discernible layer of limewash obscures the central Archangel. This plaster does appear severely abraded and uncovering may not regain much more of the image.

(4) Further testing/trials for cleaning: During the conservation work carried out in the first campaign (1992), the calcium carbonate veil obscuring the paintings was gently thinned using mechanical methods. This has meant that the paintings are clearly understood at close range (with adequate lighting) but are difficult to see from the floor. There is also a yellowish coating present over many areas, tentatively identified in 1993 as waterglass. It may be considered desirable to improve the clarity of the paintings, but this must be weighed against the risk of possible damage incurred by any such invasive conservation treatment. A small area can be chosen for trial cleaning tests, in order to assess the options currently available for the further thinning/removal of the veil and/or waterglass. However, this should only be done after research into the methods available and the further investigation of the nature of the obscuring layer(s).

(5) Further technical analysis: The technique of both schemes of painting can perhaps be further clarified by more technical analysis of the materials and application method.

(6) Presentation of the paintings: It is highly recommended that display boards are installed in the ground floor room of the tower. These could present to the public the wealth of information on the paintings gathered by English Heritage and the Courtauld Institute of Art over the course of the 3-year campaign. In addition, the presentation of the paintings could be vastly improved by the installation of sensitive lighting, perhaps on a timer system. There are a number of options available to museum standard which could be sympathetically and discreetly employed in the chapel.

(7) Monitoring condition: The importance of the paintings warrant an annual inspection in order to assess their condition.

3 Audit Information: Technique

Property name	CHESTER CASTLE		
Region	North	County	Cheshire
Location	Chapel of St Mary de Castro, first floor, Agricola Tower		
Orientation	VAULTS AND WALLS, E, W, N, AND S		
Century 13th	Date	Height (cm)0	Width (cm) 0
Auditor(s)	SS, TM	Start date	29/08/95

Overall Condition Score 2

Stratigraphy

Layer type	Support Layer	Specific condition Score	2
Thickness	50 cm		

Comments

'The gatehouse was entirely constructed of dressed ashlar blocks of the local red-brown sandstone typical of Chester. Sandstone was also used for the infill of the vaulting of the chapel. The vaulting of the ground floor of the gatehouse was remodeled in the 14th century, and west side of the tower refaced in the 19th century, but in both cases a similar sandstone to the original was employed.' [Babington & Welford 1993] The sandstone is spalling and eroding seriously, a deterioration typical of this local material.

Layer type	Render Layer 1	Specific condition Score	2
Thickness	1-2 cm		

Comments

FIRST SCHEME: 'The fragmentary remains of the earlier (12C?) scheme are in evidence above the window on the east wall and on the two adjacent vault spandrels. The preparation for this first scheme varied for the vault and walls. The vault received a plaster player (presumably to smooth any irregularities in the surface), while the walls appear to only have received a priming layer of limewash. The depth of the vault plaster of the earliest painted scheme cannot be accurately assessed due to the overlying second scheme. However, at the west end of the chapel on the south side there are small osses in the vault plaster through to the sandstone support which have an average depth of 3-4 cm. Since the plaster for the upper scheme has a thickness of approximately 1-2 cm this suggests both plaster layers are of roughly equal depth (ie. 1-2 cms). To date no evidence has been found on the walls of plaster which can be attributed to the first scheme. Perhaps the regularity of the stone surface of the walls made plastering unnecessary.' [Babington and Welford 1993]

Layer type	Render Layer 2	Specific condition Score	2
Thickness	1-2 cm		

Comments

1230's SCHEME: 'The 1230's scheme is on a uniform, rather fine lime plaster of approximately 1-2cm thickness. The plastering is smooth and fairly even, but only survives on part of the vault, the tops of the walls, and the altar recess, with only small fragments remaining on the lower wall surfaces. This has meant that sampling of the plaster to establish its content has not been undertaken.' [Babington and Welford 1993]

Layer type	Paint Layer 1	Specific condition Score	2
Thickness	n/a cm		

Comments

FIRST SCHEME: '...only a small area of the original scheme is visible, mainly at the east end of the chapel. On initial examination the palette employed appeared fairly limited with only red, black and white colours evident. The samples taken, however, reveal the scheme to have been expensive. The pigment range included red lead, vermillion and mineral blue... Evidently this choice of pigments has implications for [the use of organic] media. Unlike the later scheme this almost certainly required the use of an organic binding medium such as egg, glue, or oil.'

[Babington & Welford 1993]

Identified pigments Colours

---	blue
red lead	red
vermillion	red

Layer type	Paint Layer 2	Specific condition Score	2
Thickness	n/a cm		

Comments

1230's SCHEME: 'Preliminary sampling indicated the use of a limited palette of earth colours including red and yellow ochre, lime white and black. This range of pigments plus the additional evidence of setting-out and application methods as well as the good condition of the paint layer suggested the original technique of the paintings was fresco. It was important to confirm this not only from the point of view of ensuring that conservation treatment was compatible with the pigment types; but because fresco technique is highly unusual in England at this date. Also, for a Royal commission one might perhaps have expected a more obviously lavish display of wealth in the form of a costly range of pigments. However, the result of the more extensive subsequent investigations (undertaken 7/92) confirm this first impression.' [Babington & Welford 1993]

The paint layer appears to be applied directly to the plaster, with no use of a ground. However, in area, Babington & Welford noted the presence of a yellow ochre ground, especially under red pigments. This may have been deliberate, in order to achieve a certain optical effect.

Black and lime white were mixed to achieve a 'fake' blue. 'In some areas this is so convincing that a range of samples were necessary to establish that this was always the case.'

Identified pigments Colours

red earth	red
yellow earth	yellow
lime white	white
---	black

4 Audit Information: deterioration and damage, added materials, treatment

Property name	CHESTER CASTLE		
Region	North	County	Cheshire
Location	Chapel of St Mary de Castro, first floor, Agricola Tower		
Orientation	VAULTS AND WALLS, E, W, N, AND S		
Century 13th	Date	Height (cm)0	Width (cm) 0

DETERIORATION AND DAMAGE

Deterioration phenomena

Type cracking

Location Support; from NE to SW across the vault of the chapel

Comments These cracks 'extend across the vault of the chapel, and the central keystone has dropped. However, none of this movement appears recent, and indeed there are marks of tell-tales over several of the vault cracks which are likely to date to the restorations undertaken either last century or early this century'. [Babington & Welford 1993]

There are also hairline cracks throughout the render layer. These are especially pronounced adjacent to cement repairs, where the strength of these repairs have obviously incurred undue stress on the surrounding areas of original plaster.

Type delamination (render layer)

Location Vault: small areas, generally

Comments 'Where the vault plaster survives (and this includes the plaster of the soffit of the altar recess) it is generally coherent and stable. Some hollow-sounding areas were identified, but only small areas of plaster were detached to the extent that they required treatment.' [Babington and Welford 1993]

Type general erosion

Location Vault: surface generally

Comments 'One of the more unusual decay phenomena observed is the erosion of up to 60% of the plaster surface. In places this may be associated with the organic coatings which have been applied. When examined in UV light, much of the coating has a lace-like appearance as a result of numerous small losses in the surface.' [Babington & Welford 1993]

Type preferential erosion

Location Vault: limited to red and yellow ochre pigments

Comments 'A second type of erosion, best observed in raking light, appears linked with the use of red and yellow ochre pigments. This occurs, for example, on the foliate decoration on the soffit of the altar recess, the halo of the lower figure on section 1AE, and the vault spandrels adjacent to the east end of the chapel. Both these forms of deterioration were probably activated by the presence of salts in the plaster plus moisture. The sources of the latter being either direct, such as from the laying of the new floor above the chapel, or indirect, for example, through condensation.' [Babington & Welford 1993]

Type pitting (surface)
Location Walls: surface of the render
Comments 'It is also noticeable that immediately adjacent to the [cement and lime-based] repairs there is a marked increase in loss and pitting of the plaster.' [Babington & Welford 1993]

Type loss
Location Vaults: render; especially IBS, IBN
Comments There is obviously severe general loss of the painted plaster on the vaults, as only fragments remain, surrounded by extensive repairs of varying quality.

There are two other losses in the repair plaster of the vault which appear to be recent and should be repaired. These are IBS (small loss along central crack which occurred after the 1992 photographic survey) and IBN (a large loss in repair plaster, possibly an excavation to ascertain the stratigraphy of the plaster, again made after the 1992 photographic survey).

Type flaking
Location North wall, west bay (1A), red foliate decoration
Comments 'The paint layer, where it survives, is remarkably stable. The one exception to this is the red foliate decoration on the north wall of the west bay (1A). In painting technique this area is unlike the rest of the scheme -- executed in red on a limewash ground -- rather than directly on the plaster. Possibly, the plaster was less fresh when this area was painted, and this fact plus the later application of an organic coating, has led to the extensive paint flaking and powdering of the red ochre.' [Babington & Welford 1993]

Type losses (render layer)
Location Walls, throughout
Comments There is obviously severe general loss of the painted plaster on the walls, as only fragments remain.

There are also extensive localised losses to the surface. 'It is also noticeable that immediately adjacent to the [cement and lime-based] repairs there is a marked increase in loss and pitting of the plaster.' [Babington & Welford 1993]

Type loss of cohesion (paint layer)
Location Red pigments, especially altar recess and foliate decoration on upper section of 1A
Comments The red pigment, probably red ochre, has lost cohesion within the foliate border of the upper part of 1A, and within the altar recess. These areas do not appear to be in immediate danger of further loss, but this should be taken into account when considering any further treatment.

ADDED MATERIALS

Accretions

Type cobwebs

Location Corners

Comments The chapel was dusted thoroughly in 1992 and 1993; however some cobwebs have reappeared within the corners of the room.

Coatings/Coverings

Type inorganic

Location Present in some degree over 95% of the painted scheme

Comments 'Prior to treatment undertaken in this first phase of conservation up to 95% of the painted scheme was obscured from view by a limewash coating (confirmed by XRD analysis)... there are areas where the limewash is considerably thicker (1-2mm), and firmly attached to the paint surface.' [Babington & Welford 1993]

Much of this was removed during the 1992 campaign but the paint layer is still heavily obscured by a fine veil of calcium carbonate.

Type inorganic

Location 30-40% of the painted scheme

Comments During the 1992 campaign 'Two organic coatings were observed in UV light, over 30-40% of the scheme, one fluorescing green and one orange.' [Babington & Welford 1993]

Before the 1993 campaign the coating was tentatively identified using FTIR (by J. Pilz of the National Gallery) as waterglass (and is therefore inorganic).

During the 1993 campaign the different colours of fluorescence were thought to bear some relation to the underlying substrate: ie., waterglass over paint layer fluorescing one colour, and waterglass over lime veil over paint layer fluorescing another.

Type limewash

Location In limited areas, especially altar recess and lower walls

Comments A layer of limewash is present as small patches over the entire surface. A more general accumulation of limewash still obscures much of the paint layer within the altar recess soffits, especially on the north side.

Repairs

Type cement

Location Walls: generally as edge repairs

Comments The cement repairs were '...erratically applied, sometimes smearing over the paint surface.' [Babington & Welford 1993] These also appear to have caused the efflorescence of salts, pitting, and loss in areas adjacent to the repairs. These may relate to a 19th or 20th century intervention. Some of these dark grey cement repairs have been washed over with a yellow tone, perhaps to match the other lime-based repairs, which date from another intervention.

Type modern lime plaster

Location Walls: generally as edge repairs

Comments These are hard, yellowish lime mortar repairs, perhaps with some cement content. They are more carefully executed than the cement repairs, but also appear to have encouraged some damage through the migration of soluble salts. Some of the grey cement repairs have been washed over with a yellow tone, perhaps to match the yellow lime-based repairs, and so these may relate to a restoration of the chapel (1920s? 1950s?)

TREATMENT

Past Treatment

Type FILLS/REPAIRS INSERTION **Date** 01/01/01

Person Unknown

Comments Hard yellowish lime-based repairs have been inserted at some stage. These may relate to the 1923 intervention.

Past Treatment

Type FILLS/REPAIRS INSERTION **Date** 01/01/02

Person Unknown

Comments Hard dark grey cement edging repairs, smearing over the paint surface in places, have been inserted at some stage, after the hard yellowish lime-based repairs. They may relate to the 1923, or a later, intervention. In addition, some of the cement repairs have been painted-in with a yellow wash, apparently in an attempt to reintegrate them with the earlier yellow repairs.

Past Treatment

Type UNCOVERING **Date** 01/01/23

Person Office of Works

Comments See Frank Simpson's booklet, 1925: 'It was this record that enabled the writer to inform the Officer Commanding the Castle, and the Divisional Officer, Royal Engineers, that such a painting had existed on either side of the light above the altar recess, and if the various coats of yellow-wash were carefully cleaned off the walls, remains of the wall paintings, where the plaster remained, would probably be seen. This the Office of Works decided to do, and the task was commenced, January, 1923. The authorities deserve the thanks of every antiquary for the very careful way in which the work was carried out, which, after long and tedious labour, enabled one to see that at one time the whole of the walls and groining in the chapel had been covered with beautiful paintings -- a fact hitherto unknown.'

Past Treatment

Type UNSPECIFIED **Date** 01/01/52

Person Unknown

Comments There are records of repair work being carried out in the Tower in 1952. This may or may not relate to the wall paintings.

Past Treatment

Type UNCOVERING **Date** 01/06/92

Person English Heritage/Courtauld Institute of Art

Comments Dusting and thinning of the limewash veil present on the vault paintings, and upper wall paintings, was carried out during the first phase of treatment in summer 1992. This formed part of the collaborative training programme between English Heritage and the Courtauld Institute of Art. Brushes and Wish-ab sponges were used.

Past Treatment

Type	FILLS/REPAIRS INSERTION	Date	01/06/93
Person	English Heritage/Courtauld Institute of Art		
Comments	'Certain areas along the west wall, north wall, and behind the column in the northeast corner were chosen for emergency plaster edging repairs. These were done using a 5:1 local red sand and lime mortar, chosen for colour and weakness during the first campaign. Edges were wetted out using rolled-up pieces of tissue that had been soaked in deionized water and squeezed gently into the gaps where lifting was evident. This was left for a few minutes for diffusion into the surrounding plaster and support, at which time the tissue was removed and the edge filled with mortar... These served to seal the gap (with as weak a substance as possible) between the plaster and the stone, in order to prevent further loss from the edges.' [T.Manning, student report on fieldwork, 1993]		

Type	UNCOVERING	Date	01/06/93
Person	English Heritage/Courtauld Institute of Art		
Comments	Dusting and thinning of the limewash veil present on the lower wall painting fragments, including the altar recess, was carried out during the second phase of treatment in summer 1993. This formed part of the collaborative training programme between English Heritage and the Courtauld Institute of Art. Brushes and Wish-ab sponges were used.		

Past Treatment

Type	FILLS/REPAIRS INSERTION	Date	01/06/94
Person	English Heritage		
Comments	Further repairs were made (by C. Babington and S. Stewart of the Conservation Studio) to fragments of plaster, including edges and small losses, on the upper walls and vaults during the final campaign of treatment in 1994. The same mortar mix was used (5:1 local red sand and lime).		

Type	GROUTING	Date	01/06/94
Person	English Heritage		
Comments	Limited grouting was carried out (by C. Babington and S. Stewart of the Conservation Studio) as part of the final phase of treatment in June 1994. A standard lime:trass grout mix was injected into hollow areas identified during the second campaign. However, only areas which were considered to be vulnerable were selected for treatment.		

Proposed Treatment

Type	FILLS/REPAIRS INSERTION	Date	29/08/95
Person	TM, SS		
Comments	Minor repairs are required in the following areas: IBS (small loss along crack), IBN (excavated area), and the edges of two small fragments on the far north side of the east wall, upper tier.		

Type	MONITORING CONDITION	Date	29/08/95
Person	TM, SS		
Comments	Given the importance of the paintings it is highly recommended that they are inspected on an annual basis.		

Type	STRUCTURAL REPAIRS	Date	29/08/95
Person	TM, SS		
Comments	An employee of the Military Museum believes there is a leak in the roof and that moisture is reaching the chapel vaults; it is imperative that this be checked as soon as possible.		

Type	TECHNICAL ANALYSIS	Date	29/08/95
Person	TM, SS		
Comments	Further analysis could be carried out in order to fully understand the technique of the paintings and the later coatings.		

Type	TESTING	Date	29/08/95
Person	TM, SS		
Comments	Further testing could be carried out on the cleaning of the paintings, ie. the removal of the fine limewash veil to make the various schemes more legible. This could be an opportunity to research and test possibilities for their future treatment. However, there is not an abundance of painted plaster suitable for testing, and any system of removal may compromise the present stable condition of the paintings.		

Type	UNCOVERING	Date	29/08/95
Person	TM, SS		
Comments	The limewash which obscures the second Archangel on the north side of the altar recess could be thinned and/or removed if desired. The plaster appears to be severely pitted and abraded underneath, but it may reveal more of this figure. There are also some small lime patches over the inscription adjacent to the aumbry. These could be thinned and/or removed if it was thought desirable to reveal more of the inscription.		



Detail, east bay, south side, western vault, *Visitation*



Detail, west wall, north side, bishop of Adana