

# Glastonbury Abbey South Nave Aisle



## Archaeological Survey of the standing fabric - 2004

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## **Glastonbury Abbey - The south nave aisle**

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### *Summary*

*Close inspection of the fabric of the south nave aisle has led to a reinterpretation of the structural history of the nave complex of the Abbey:*

*- the lowest part of the wall to the roof of the north walk of the cloister was built during the primary phase of building [1184-9] to provide the abutment for the cloister*

*- the eastern part of Bay 4 marks the limits of the first identifiable phase of building of the nave above the cloister roof, and this area may be associated with the abutment required for the construction of the transept and crossing*

*- the remainder of the upper part of the south nave aisle wall was deferred probably until the second decade of the thirteenth century, and the use of upper lias ashlar in the spandrels above the window in Bay 6 suggest that the Abbey was then in much straitened circumstances*

*- only the four eastern aisle bays (and probably the three eastern nave bays) were completed in the early thirteenth century; it seems likely that this short eastern arm of the nave served the community until the later part of the century*

*- while the eastern four bays of the aisle were complete, but before the western bays were weatherproofed and vaulted, a lightly built pentice walk seems to have been built from the west cloister door to the entry into the functioning nave*

*- the surviving west wall of the nave is of mid-thirteenth century date, and the construction of the Galilee to provide a linkage between the Lady Chapel and the nave implies that the latter was substantially complete and weatherproof by the Abbacy of John of Taunton [1274-91]*

*- in the first three decades of the fourteenth century the nave was vaulted throughout, and it seems likely that a parapet was added complete with rainwater down-pipes. The early fourteenth century aisle vaulting included internal flying buttresses beneath the triforium roof*

*- under John Chinnock [1375-1420] the cloister was renewed, the new structure being virtually freestanding, the wall-shafts merely pinned to the nave wall and the wall-plates fixed with mortar; the flying buttresses bridging the north walk were probably constructed as part of this work, and the rainwater drain-pipes had to be moved aside to accommodate them. Probably as part of this work the nave windows were fitted with new tracery.*

*The interior of the nave was plastered, limewashed and painted, and small survivals of the plasterwork remain in many places. Surviving pigments are limited to red and black on a thin ground in the apex of the window of Bay 4.*

*Following the dissolution the ruin was stripped of anything of value, all the iron fixings being roughly cut out and the lead torn from the round-headed nails fixing the drain pipes and cloister roof. A repair to the south wall of the nave took place after 1723 and prior to the late nineteenth century. The extent of the main campaign of stabilisation and repair under W.D. Caröe has been identified. A campaign of repointing took place in 1971, and of conservation in 1989.*

## 1 Introduction - the circumstances of the report

The provision of scaffolding access for repairs and conservation to the remaining fragment of the south nave aisle of Glastonbury Abbey at the end of November 2004 has allowed an archaeological survey of the standing fabric of this part of the building to be undertaken. Following a preliminary site meeting on Friday 12 November the survey was carried out between 23 November and 8 December by Jerry Sampson, at the request of Alan Thomas RIBA, the architect for the Abbey.

Findings were initially plotted onto 1:50 scale drawings prepared by Alan and Ann Thomas, Chartered Architects [Drawing Nos. 262/50-7], and these site drawings are bound with the current report. A photographic survey was undertaken by Carrek Conservation prior to the commencement of work; this was not duplicated as part of the archaeological record, but detail photographs illustrating the archaeological findings have been taken and are being scanned to CD to form part of the archive - an index of these is included as Appendix 2.

## 1.1 Previous surveys

- 1.1.1 The standing fabric of Glastonbury Abbey has not been exhaustively surveyed in the past. Willis first analysed the structural remains in 1866,<sup>1</sup> and Bligh Bond described much of the ruin in his *'Handbook'*.<sup>2</sup> During conservation work in the 1980s the present author had access to the repair scaffolding, but this was of limited extent, since areas of the south elevation where the conservators did not require direct access were not planked out, leaving large parts of the masonry still inaccessible. Brief reports of these inspections were prepared for the Trustees of the Abbey.
- 1.1.2 In the early 1980s a detailed report on the Lady Chapel doorways, incorporating the conservation report of the Wells Conservation Centre, was prepared and lodged with the Abbey. This was followed in 1995 by a polychromy survey of the Lady Chapel by the present author and Sue and Lawrence Kelland, with an analysis of the pigments etc. by Eddie Sinclair; the survey leading to a four volume report, and the colour reconstruction of the interior of the Lady Chapel drawn by Liz Induni which is currently on display in the ruin. During the course of this work much evidence for the internal furnishings of the Lady Chapel was also observed and recorded.
- 1.1.3 The close access given by the present scaffolding has allowed a much greater degree of investigation to take place, and the results are commensurately much more extensive, providing greater detail of the structural history of the nave and cloister. The present exercise illustrates the extent to which close analysis of standing fabric can still provide new insights into the history of even the most famous and best studied buildings.

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<sup>1</sup> Willis 1866 - see p.45-6 for his consideration of the remaining fragments of the nave.

<sup>2</sup> Bond 1910.

## 2 The south Nave aisle wall

### 2.1 Introduction

2.1.1 Despite being the only remnant of the monastic nave, and comprising only three complete [Bays 4-6] and two part bays of the south aisle's southern wall, this fragment of the Abbey exhibits a complex medieval phasing, together with at least four phases of post-medieval repair. Within the initial building period in the late 12th and early 13th century two major phases can be isolated, while the pattern of vaulting provides evidence for two of the major phases of construction of the nave, which was only finally completed during the abbacy of Adam of Sodbury [1323-34].

### 2.2 Phasing

#### 2.2.1 1184 -1189 and the c.1189 break

2.2.1.1 The earliest construction at Glastonbury Abbey, following the fire of 1184, can be characterised by reference to three main features:

- the use of relatively shallow courses of Doultling stone, generally in the range of 17-25 cm bed depth

- fine diagonal tooling of the ashlar, cut with a boaster

- the use of Dundry stone for the fine carved work: capitals, complex mouldings, foliate and figural work, etc.

This type of masonry is found in the choir aisles, the lower parts of the crossing, the Lady Chapel, and the lower parts of the surviving fragment of the nave aisle, but not in the west end of the nave. This form of fabric is almost certainly that of the primary building campaign [1184-9] under Ralph Fitz-Stephen, who, according to the chronicler Adam of Domesday, rebuilt not only the western Lady Chapel [1184-6/7] and a substantial part of the eastern arm of the church but

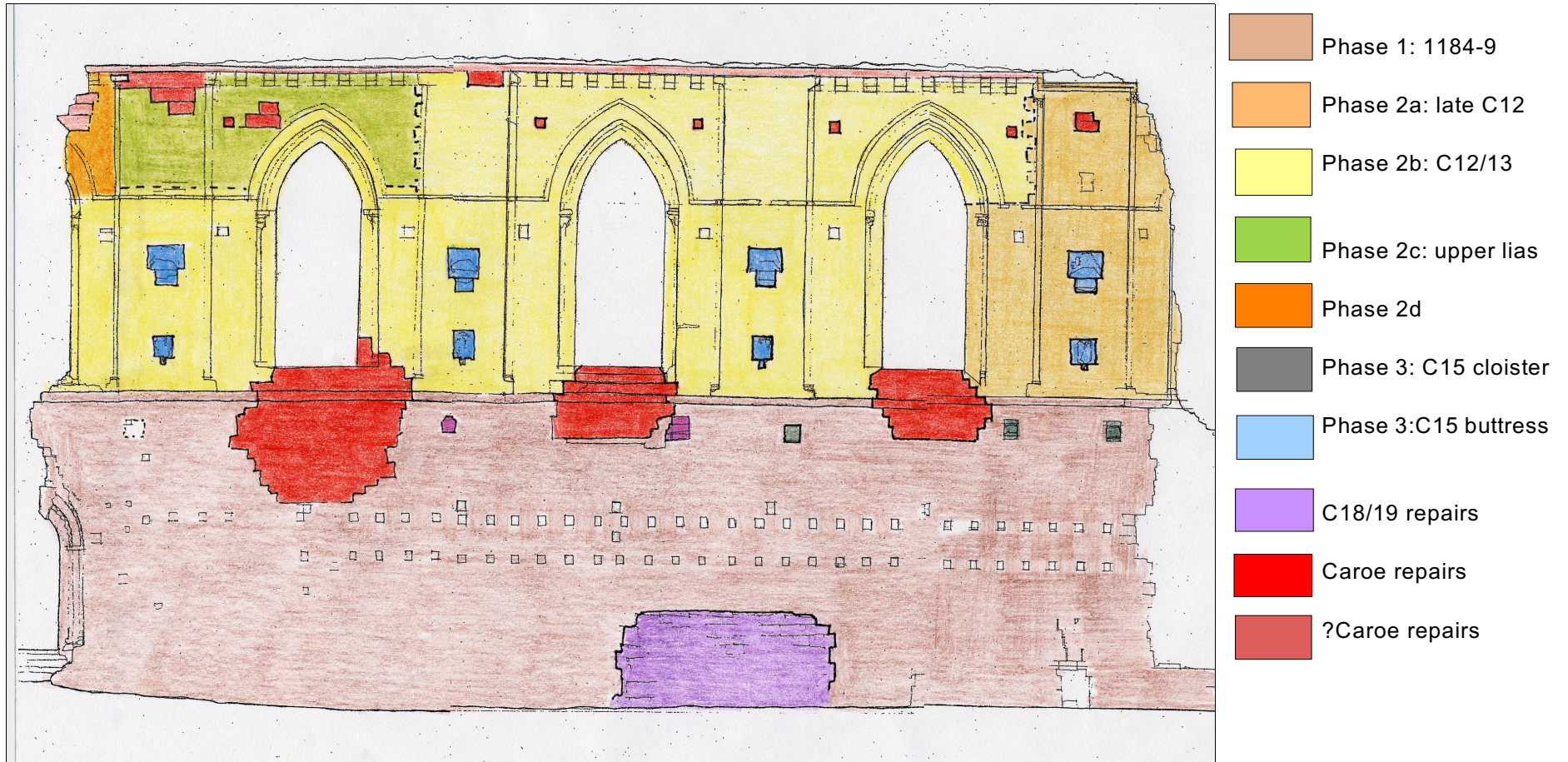
"repaired all the offices of the monastery, and lastly, laid the foundations of the *ecclesia major*, 400 feet in length, and 80 feet in breadth."

- 2.2.1.2 That the south nave aisle wall belongs with this earliest fabric is shown by the traces of diagonal tooling remaining chiefly on the north elevation, where the stone is better protected from direct weathering. The coursing on the south elevation rises in places in almost regular heights of 23-25 cm<sup>3</sup> - only once exceeding 25 cm, and that only in the topmost course. The only decorative carved work in the lower part of the south nave aisle wall is found in the two orders of chevron-carving in the cloister door, and these (together with the projecting hood-moulding on the north elevation of the door, and its broken label stop) are all in Dundry stone, while all the carved work above is of Doulling.
- 2.2.1.3 Indeed, the similarity of the lower part of the nave aisle wall to the walls of the choir and Lady Chapel strongly suggests that when Domesday speaks of 'foundations' he is referring not just to the below ground structure, but also to the plain walling beneath the window openings, since there is a distinct change in the form of the fabric six courses above the sill-level string-course on the northern elevation of the wall - a level which corresponds to the sill-level string-course (which forms the drip-moulding of the cloister roof) on the south elevation of the aisle.
- 2.2.1.4 This interface can be seen clearly in Bays 4 and 5, and the remaining fragments of Bays 3 and 7, but is less easily identifiable in Bay 6. From Bay 3 to three-quarters of the way across Bay 5 it lies 120 cm above the top of the northern sill-level string-course, at which point it drops a course to 99 cm above the string. This is also its level in the remaining section of Bay 7 and across the wall-mouldings dividing Bays 6 and 7. It is probable that the same level was maintained across Bay 6, but the line here may have been more variable. There is another drop to the 99 cm level on the wall-mouldings dividing Bays 4 and 5, showing that the plain ashlar masonry tended to be slightly in advance of the complex mouldings, but overall the horizontal level of the masonry is maintained right across the remaining fragment of the nave wall, and is presumably the result of the need to build the south elevation of the wall up to the drip-course of the cloister roof-line in order to provide the monastic community with a functioning cloister.
- 2.2.1.5 The pattern of decay is of interest here also, since there is a tendency on the

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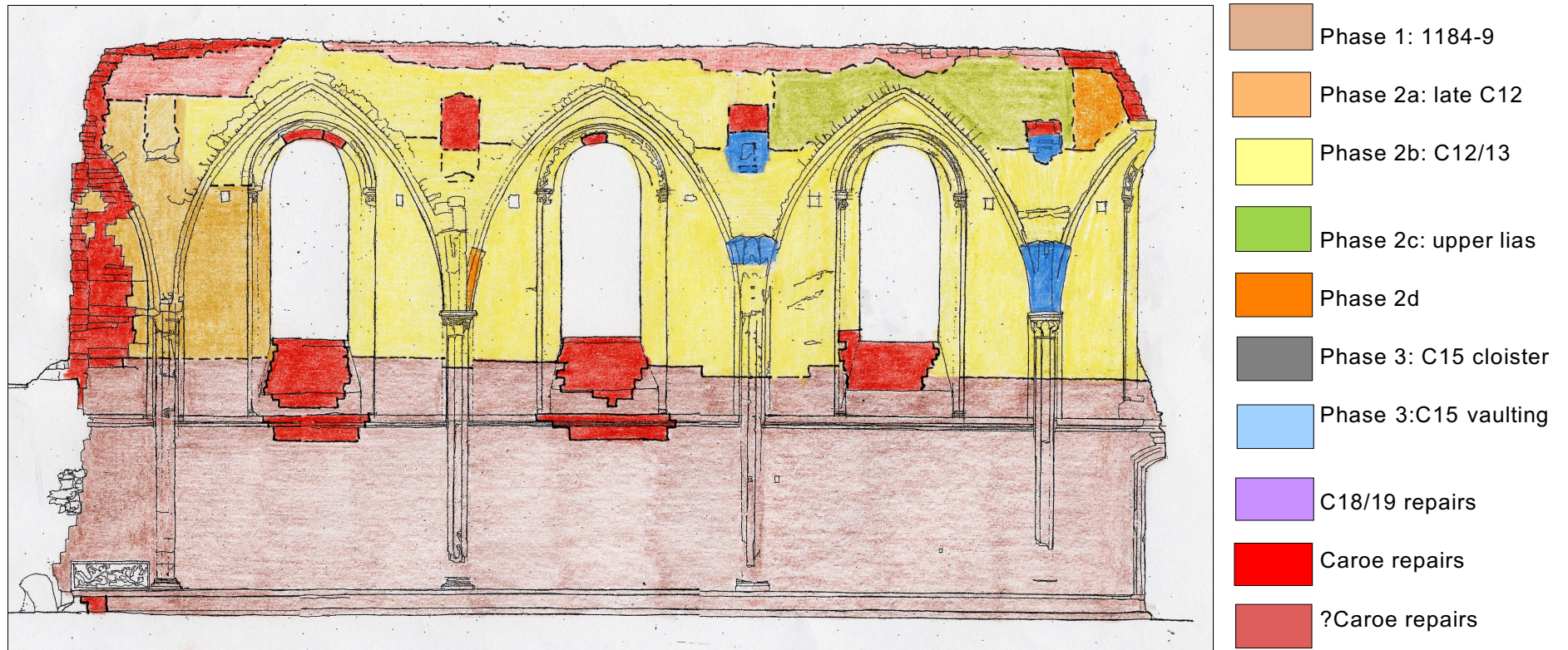
<sup>3</sup> The course heights from the cloister-roof string-course downwards runs: 20, 19, 25, 15, 24, 24.5, 12.5, 24, 25, 24, 24.5, 24, 24.5, 20, 23, 18, 19, 22, 22, 21, 22, 24.5, 19, 18.5, 22, 24.5, 27





South Nave Aisle: South elevation





South Nave Aisle: North elevation phasing

north elevation for the course immediately above the break to have decayed much more than the rest of the surrounding masonry. This could be the result of the exposure of the core-work during the hiatus in building having allowed the lime mortar of the wall top to carbonate much more effectively than usual, forming a more impenetrable horizontal layer within the wall. This would then present a barrier to water-borne salts within the wall during the period of the ruination of the abbey, encouraging their deposition in the course above the building-break. This pattern of decay holds true across the eastern bays, but the decay tends to occur just **below** the projected line of the break in Bay 6, where the line of the break is less easy to identify.

2.2.1.6 From here upwards the Doulling stone has a distinctly more open texture, has tended to weather to a yellowish colour, and supports a different lichen flora; it has been laid in deeper courses - tending towards 30-40 cm and on occasion using even deeper block.<sup>4</sup>

2.2.1.7 There is known to have been an hiatus in the building works following the death of Henry II in 1189, as Adam of Domesday says,

"Great part of the *ecclesia major* having been built, the rest would have been beautifully completed had the Lord prolonged the king's life. But alas, covetous death snatched him away too hastily and the monks, just recovering breath from their last misfortune, were smitten with a heavier wound, for he died on the 6th of July, 1189, after reigning for 35 years.

"He was succeeded by his son Richard, whose war-like tastes diverted his attention from the building of Glastonbury church. Wherefore the work stopped, because no funds were forthcoming to pay the wages of the workmen."<sup>5</sup>

2.2.1.8 The form of the fabric in the upper part of the south nave aisle wall is much more similar to the fabric of the west wall of the nave, the stonework being entirely of Doulling, without carving-block being provided of Dundry stone, and, where the tooling can be identified in its weathered state, it always shows vertical re-tooling of the finished surface.

2.2.1.9 A very similar change from small diagonally tooled Doulling block to larger vertically tooled stones occurs at Wells Cathedral in the middle of the nave

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<sup>4</sup> The disparities in coursing are fully detailed in the General Appendices of Sampson 1996 - Appendix 4 pp.5-6, Appendix 5 pp.1-3 and Appendix 6 pp.11-12

<sup>5</sup> This and the previous quotation from Domesday, quoted in Willis 1866, p.22.

between bays four and six from the east, a break identified by John Bilson in the 1920s<sup>6</sup> (and probably first isolated by Willis in the 1860s),<sup>7</sup> and interpreted by Colchester and Harvey as a signature of the Interdict (1208-13),<sup>8</sup> but certainly (both at Wells and Glastonbury) indicative of a hiatus in the building programme.

## 2.2.2 The mid-nave break

2.2.2.1 While it is clear that the whole of the surviving side wall of the aisle was built to its remaining height at the end of the twelfth and the beginning of the thirteenth century, the north elevation of the aisle wall shows evidence that the nave was not finished at that time, and that the western five bays of the nave seem to have remained incomplete until the early fourteenth century.

2.2.2.2 The eastern remaining complete aisle bay [Bay 4 from the east] was vaulted with ribs having the same moulding as those of the choir, with plain rolls at the outer angles and a narrow V-shaped ridge on the soffit between them; the vaulting of the western complete bay [Bay 6], however, has a moulding of fourteenth century profile, with a single wide ogee roll-and-fillet at the soffit of each rib. Bay 5 represents the transition between these two styles of construction, since its western springer was evidently constructed of the same large blocks of rather open-textured Douling stone that are found in the springer-stones of Bay 6/7, and has its eastern diagonal rib of the thirteenth century double-roll type, but the transverse and western diagonal ribs of the later form - all three ribs being carved on the same stone and, therefore, necessarily contemporary.

2.2.2.3 The springer between Bays 4 and 5, at the eastern margin of Bay 5, has all three ribs of early thirteenth century form, but there are two major anomalies in their construction:

- the western diagonal rib is formed of separate stones to the eastern diagonal and main transverse ribs, the latter being carved on a single block, but the former being fitted against their western side

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<sup>6</sup> Bilson 1928.

<sup>7</sup> Willis 1863-4.

<sup>8</sup> Colchester and Harvey 1974.

- there appears to be little or no curvature on the main transverse rib, which, instead of curving out and away from the wall, appears to rise vertically

Neither anomaly is easy to account for, but it is probable that this point represents the line at which the temporary wall, closing off the completed work of the nave to the east, was erected when the first three bays of the nave had been completed, the builders erecting the centering to complete the vault webs of Bay 4, but not for Bay 5. Thus, the springers would be needed for the eastern and transverse ribs to complete the bay, but not the western diagonal rib, which would wait for the erection of the centering for Bay 5 during the next campaign of work to the west.

- 2.2.2.4 Evidently the thirteenth century building campaign saw some continuation of work beyond the temporary wall, since the transition to the fourteenth century vaulting form occurs at the western (rather than the eastern) margin of Bay 5, and it is possible that the whole of this severy was erected during the thirteenth century, and that the western springer was inserted by underpinning an existing thirteenth century vault. Evidently the whole of the existing south aisle wall, and almost certainly the complete Bay 7 beyond its western end (containing the cloister doorway), was constructed in order to provide the abutment for the new cloister - more essential to the running of the monastery than the western arm of the great church would have been - but the vaulting of the aisle was certainly left incomplete beyond Bay 5.
- 2.2.2.5 The style of the remaining fragment of the west wall of the nave is clearly of the thirteenth (rather than the fourteenth) century, and it seems certain that the entire circuit of the nave walls was completed in that century, but the upper walls, and certainly the vaulting of the nave, were deferred until the following century. Documentary evidence suggests that work was still progressing on the vaulting of the east nave under Geoffrey Fromond [1303-22], and that the vaulting of the west nave was only completed under Adam of Sodbury [1323-34].
- 2.2.2.6 The deferral of the vaulting, however, does not necessarily imply that parts of the nave were not roofed over and weatherproof much earlier, and the vaulting of the four eastern bays of the nave aisle suggests that the builders were working to a programme of construction similar to that which took place at Wells cathedral and elsewhere, in which the eastern part of the nave was made ready for use and enclosed with a temporary wall so that the building of the





Above left: the late twelfth or early thirteenth century vaulting springer of Bay 4/5 looking South-East, showing the apparently vertical rise of the transverse rib.

Above right: the fourteenth century vaulting springer of Bay 6/7 looking South-West.

Left: the base of the internal flying buttress originally situated beneath the nave aisle roof, looking east. The lias voussoirs forming the base of the arch at the bottom, with the nineteenth century repairs set above not following the curve of the arch.



remainder of the nave could continue to the west.<sup>9</sup> It seems likely, therefore, that the nave of Glastonbury Abbey was erected in two main campaigns, the first comprising the eastern four aisle bays, and probably only three bays of the high work of the nave - the fourth aisle bay being provided as buttressing to the high work. This is the pattern at Wells, where three bays of the high work of the nave were erected by c.1214,<sup>10</sup> and the whole nave was not completed until c.1250. At Glastonbury it seems likely that the three eastern bays of the nave were sufficient to serve the community until much later - though it is likely that the west nave roof was added to the completed nave walls well before the vaults themselves were turned in the first half of the fourteenth century. The addition of the Galilee between the Lady Chapel and the Nave's west door during the abbacy of John of Taunton [1274-91] must indicate that the nave was sufficiently complete at that time to warrant the construction of a link between the Lady Chapel and the great church, and we may perhaps envisage either a temporary wooden ceiling, or the western nave being open to the roof.

## 2.3 The cloister-nave passageway

2.3.1 While the east nave stood complete and prior to the roofing of the west nave it seems likely that some provision would have been made for the monastic community to process into the usable section of the nave from the western end of the cloister. The presence of the western door from the nave aisle to the north-west corner of the cloister (which is stylistically part of the first phase of masonry), and the deliberate choice of the cloister roof drip-course as the top of the first phase of construction of the south aisle wall, shows that the circuit of the cloister was a priority for the builders in the early years of the post-1184 rebuilding, and this would seem to imply a predisposition to use the south nave aisle as a processional approach to the east nave in the thirteenth century.

2.3.2 In this context it is interesting to note that there is a series of small cut recesses in the plain stonework of the north elevation of the nave aisle, located in bays

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<sup>9</sup> The alternative scenario, that only the aisle itself was built (leaving the high work of the east nave until the early fourteenth century) seems unlikely for several reasons, not least that **only** the four eastern aisle bays were built, when the opportunity existed of providing the whole of the south aisle between the cloister doors and thus completing the processional circuit of the cloister/great church.

<sup>10</sup> Date based on dendrochronological analysis of timbers in the east nave roof. At Wells 5 bays of the aisle were completed to allow the north porch to function; the Glastonbury north porch was placed farther west, and probably did not serve the east nave, whose main approach at this date would have been from the cloister of the convent to the south.

5, 6 and 7, but not found in bays 3 or 4 - that is, within the confines of the area west of the completed east nave, running up to the doorway into the northwest corner of the cloister. These recesses are generally 6-8 cm wide, around 9 cm high, usually 3 cm deep at the base, and wedge-shaped, running out to the top. In all cases their lower edge corresponds with a bed-joint, and one side with a perpendicular - indicating that they could only have been cut when the masonry was exposed, and therefore presumably before it was plastered over following the completion of the roof. The shape of these recesses is very similar to that of the recesses cut into the south elevation of this wall and associated with raking shores for the first, wooden cloister, though their much wider spacing would seem to imply an altogether lighter structure.

2.3.3 The distribution of these recesses is fairly regular, the first lying just under a metre west of the presumed position of the temporary wall between Bay 4 and 5; thence they are centred 185 cm and 180 cm apart, the last in Bay 5 being 112 cm east of the wall-moulding between Bays 5 and 6, the next being centred 100 cm west of it. The last four (three in Bay 6 and one in Bay 7) are centred 140 cm, 137 cm, 185 cm and 158 cm apart. There are considerable variations in their height: the first four are on the bed at 98 cm above the top of the wall-bench; the next three drop to the bed below at 76 cm above the bench; and the westernmost (near the cloister door) rises two courses to 124 cm. It is interesting, however, that the relative height of the sides of these recesses increases the lower down the wall the recess has been cut, as if responding to the change in angle of raking shores supporting the soffit of beams set at a constant height. In all cases the depth of the recess is between 2.5 and 3.5 cm, and suggests that the raking shores which they appear to have accommodated were additionally supported by vertical timbers resting on the bench-top. No certain indication of the seating of the beams which such raking shores must be assumed to have supported has been found, however, and the height and form of the roof remains obscure.

2.3.4 To render the west door operable it would seem likely that such a temporary passageway would have had to be high enough to allow the door to open inwards into the nave, suggesting that at its western end, at least, it must have been over 3 metres high. This might suggest that the sills of the windows and the top of the string-course at their level were the seating for the roof beams.<sup>11</sup> The only other possibility is provided by the presence of an inserted block at the centre of Bay 5 between 278 and 312 cm above the existing ground level, which could conceivably have been the seating for a roof beam.

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<sup>11</sup> There is a single cut recess in the innermost moulding of the sill-level string in the western half of Bay 5, on a line vertically unrelated to the position of the cut recesses below.

## 2.4 Other features of the interior of the south aisle

2.4.1 In Bay 4, vertically beneath the western window jamb, there are two small square holes placed on the same vertical axis, centred 110 and 230 cm above the present ground level. The lower is a roughly worked square recess 7 cm on each axis, and within can be seen the end of a circular drilled hole; the upper contains a stone insert fixed with lime mortar, and is 7 cm wide and 10 cm high. The presence of a drilled hole at the back of the lower recess suggests that a metal fixing has been deliberately cut out - presumably during the middle ages - and it and the upper fixing may indicate the former presence of a fixed furnishing, such as a screen, at least 240 cm high. The position within the bay - well east of the nearest nave pier - suggests something other than a bay division, however.

2.4.2 Fixings for features which could conceivably have spanned the aisle and had a northern end fixed into the arcade piers exist in Bays 4, 5 and 6, where, just to the west of each wall-shaft dividing the bays, there is a small cut recess. None of these are particularly large, nor do any have additional fixings on the same vertical line (unlike those discussed above), so any structure with which they may have been associated would appear to have been fairly light.

## 2.5 The south aisle roof-space

2.5.1 Above the vaulting the north elevation appears to have been composed of marlstone and upper lias rubble work, with occasional Doulling pieces, the wall thinning considerably. The height at which this reduction in the thickness of the wall occurs varies: generally it lies about 1 metre above the internal springing of the windows, but above the eastern vault springer [that is, Bay 3-4] it lies considerably higher.

2.5.2 Above the vault-springers are projecting baulks of masonry, partly consisting of rebuilding in coursed blue lias rubble, probably of 1912. In the two western instances [Bays 5-6 and 6-7], however, the form is not a simple projection, but the centre of the north face has a square projecting 'keel'. This probably represents the rubble core of an ashlar-clad northern face, and behind it the lower courses of the lias rubble work appear to be medieval, and show successively more tilted courses, forming the springing of what appears to be a relieving arch. Evidently in the two western bays (above the two 14th century springers) internal flying buttresses were built up against the south face of the nave clerestory wall, of which these baulks of masonry are the surviving bases.

The eastern bays show no sign of the lias relieving arch, and any internal flying buttresses must have been to a different pattern. Similar concealed buttressing is part of the construction of the nave, choir and transept triforia of Wells cathedral [c.1175-c.1240].

## 2.6 The use of upper lias ashlar

2.6.1 The stonework of the twelfth and thirteenth century fabric of the Abbey is remarkably fine, particularly that of the first [1184-9] phase of construction. In the slightly later upper parts of the south nave aisle wall the Douling stone has a somewhat more open texture, and has tended to lose its finished surface through weathering, but it was clearly of good quality and well finished. It is somewhat surprising, therefore, to find that the bulk of the masonry on the south elevation of Bay 6, from one to two courses above the springing of the window, is not cut from Douling stone, but is ashlar worked from the much softer upper lias beds. This masonry lies at a sufficient height that its different geological origin is not immediately obvious from the ground, even though much of it has lost its surface layer; but at close quarters the very fine texture and the slightly beige colour of the block shows very clearly.

2.6.2 The distribution of this stone is restricted to the spandrels of the window and to the plain ashlar of the buttress between Bays 6 and 7, all being above the string-course which forms the hood moulding of the window; the remaining spandrel of Bay 7 is all of Douling stone once more. Also found in this area of Bay 6 is one block of very orange sandstone in the western apex of the window's outer moulding, and a burnt block of Douling stone, which may indicate that fragments of masonry damaged in the 1184 fire were still being recycled at this time. If nothing else, the distribution of the upper lias ashlar suggests that the building-crew at this time was operating on a much restricted scale: rather than the large areas of construction suggested by the long horizontal line of the masonry below the sill-level break, this patch of masonry restricted to a single bay probably represents the production of a single building season - less than 6 feet in height and less than 20 feet long.

## 2.7 The windows

2.7.1 While its presence has always been noted by commentators on the architecture of the Abbey, no fully convincing explanation exists for the disparity in the form of the inner and outer elevations of the nave aisle window heads. On the



Above: decay along the interface between the Phase 1 and Phase 2 fabric - possibly the result of the extreme carbonation of the lime mortar core of the head of the Phase 1 wall



Above: Upper lias ashlars in the eastern spandrel of Bay 6. Much of the Douling stone at the top of the wall is repair dating from 1912. Note the burnt block at upper left.



exterior the windows are fully Gothic, with acutely pointed heads, but on the interior the windows terminate in round-headed arches, and the use of zig-zag ornament to frame the heads of alternate windows adds to the sense of a Romanesque building style. The presence of the north walk of the cloister on the exterior of the south aisle has forced the sills of the windows upwards, and the exterior window heads do have a higher springing than the interior round-headed arch, so that there is a structural argument for the change on the interior, particularly since the splay of the windows in the thickness of the wall pushes the internal springing position even further outwards, so that a semi-circular arch is much easier to set out within the available space.

- 2.7.2 However, it is possible that there may also be a deliberate psychological factor at work here, just as there appears to be in the architecture of the Lady Chapel. The latter building, replacing the *vestusta ecclesia*, the core of Glastonbury's ancient foundation, appears to have been reconstructed following the 1184 fire in a deliberately retrospective style, with Romanesque window openings, interlacing arcading, and round-headed doors with carvings in medallions redolent of work which was already out of date. While this could be seen as a sign of the innate conservatism of the convent, it is nonetheless clear that the vocabulary of the Early English style was well understood by the builders of the new Abbey church, since the contemporary work in the Choir was clearly of that form. It would appear rather that the Lady Chapel was intended to evoke in the pilgrim a sense of the past, of the tradition of the Abbey stretching back in time - an idea which was certainly current nearby at Wells Cathedral, where a fragment of the Anglo-Saxon cathedral was preserved in the 1190s rebuilding, and a set of retrospective effigies was commissioned for their Anglo-Saxon bishops, then being translated from the Romanesque cathedral. It is therefore possible that the greater technical simplicity of round-headed windows in the nave aisles was also being exploited to add to the sense of the ancient tradition of the Abbey's great church within the nave, the most public part of the building complex.
- 2.7.3 At St Davids Cathedral in Pembrokeshire - a building with historical and stylistic links to Glastonbury Abbey, and which was being reconstructed from 1182 - the nave is built with round-headed clerestory windows, doors and all but the westernmost arches of the arcade, while the chancel has pointed arches in all but the lower tier of the east windows. Here, too, the builders may have been trying to evoke the same sense of ancient tradition stretching back to the sixth century monastery of St David within the context of their new building.
- 2.7.4 In constructing the windows the builders may have left slight signs of the seating points for their centering. In Bays 4, 5 and 6 there are series of small square patches on the lines of the springing of both the inner and outer arch-heads. For instance in Bay 6 the upper set of these takes the form of

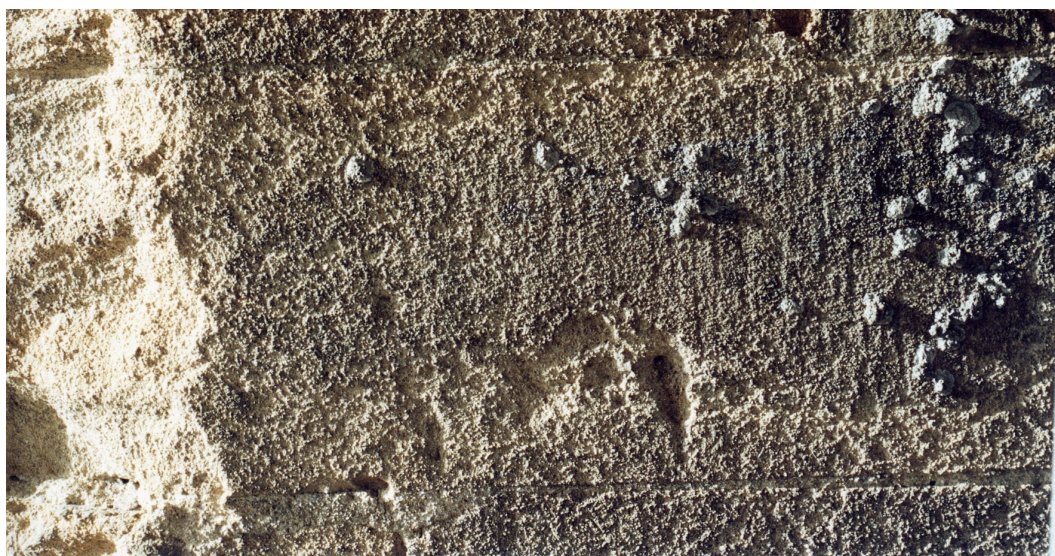


rectangular mortar patches centred around 25 and 60 cm back from the glazing line; while the lower springing line associated with the inner arch-head has a single filled rectangular patch adjacent to the angle between the jamb and the chamfer which runs back to the nook shaft. The infilling of these recesses shows that they went out of use in the middle ages, while the mortar fill is so similar to the construction mix that it seems certain that they were filled very soon after the completion of the windows. A similar pair of square recesses, perhaps also associated with support of the centering exists immediately below the springing of the cloister door (q.v.).

- 2.7.5 The form and history of the glazing is difficult to reconstruct, in part because of the damage to the window jambs. The only supports for the glazing appear to have been a pair of saddle-bars, the lower about 1.5 m above the top of the sill, the upper at the springing of the arch - about 1.7 m higher. The 2" square holes suggest that these were quite heavy irons, about 1½" square, which could have supported glazing in a wooden frame set into the shallow rebate in the edge of the outer jamb of the windows, as appears to have been the case at Salisbury Cathedral. Twelfth century ferramenta were often quite complex armatures, involving circular and vertical attachments related to the divisions and borders of the scenes of the window glass.
- 2.7.6 The extensive damage to the outer frame of the remaining window jambs - clearly caused by the deliberate cutting away of the southern 20 cm or so of the jambs to a maximum depth of about 5 cm - suggests the possibility that the glass may have lain on the inside of the ferramenta at the time of the Dissolution. Such brutal treatment of the stonework could represent an aspect of the despoiling of the abbey following its surrender to the King's commissioners, in the rapid and careless cutting out of the glazing, probably to retrieve its lead rather than for the reuse of the glass. If, however, the glass were in external frames it would have been much more accessible from the exterior and could probably have been removed from the cloister roof without needing to attack the stone. Therefore, in this scenario, it seems likely that the glazing had been renewed in the later middle ages and had been set into the jambs in a fairly deep groove, which seems to have been entirely cut away in the process of extracting it.
- 2.7.7 Alternatively, given that the entire erasure of this putative glazing groove seems inherently unlikely, it is perhaps more likely that the reworking of the outer 20cm of the jambs represents both the flattening and roughening of the surface during the insertion of later medieval window-tracery into the wide twelfth century openings. In favour of such an interpretation is the fact that there is none of the rough-cutting of the stone to extract the ferramenta bars which is seen elsewhere in post-Dissolution period contexts - against it is the apparent lack of mortar residues which might have been expected to have survived from



The chamfered face of the C12/13 window jamb cut away to accommodate the inserted tracery of the C14/15 windows, the inset showing both the roughly tooled surface and one of the sockets for the saddle-bars. Below: vertical tooling on the upper part of the wall.



the fixing of the new tracery stones. The loss of the sills of the windows has removed any evidence of the stooling for mullions, and the insertion of a complete order of new stone within the 12th century jambs would mean that no evidence of the form of the tracery would survive; but the working flat of the jambs within regular confines, rather than a more irregular and rougher cutting to remove the glass, does suggest that this damage reflects a late-medieval alteration of the windows. Fifteenth century tracery was inserted (and partly survives) in the Lady Chapel windows; while at Wells Cathedral virtually the whole church was given Perpendicular period two-light tracery, beginning at some time prior to the 1420s.<sup>12</sup> If the Glastonbury work were part of the refurbishment of the cloister and the provision of flying buttresses to the south side of the nave under Abbot Chinnock it would have been contemporary with the Wells campaign, providing yet another instance of the rivalry and imitation which appears to have characterised the relationship between the two buildings.

2.7.8 In Bay 5 there is an unexplained series of square recesses cut into the window jambs at two levels. On either jamb, halfway between the apex and the sill, are three square sockets, each between 11 and 15 cm square and up to 36 cm deep; four are filled with squared fragments of tufa (two mortared in), the other two with loose weathered fragments of Doultling stone mouldings. The other two holes lie on the line of the sill, at approximately half way across the depth of the window jamb. The use of tufa, and the fact that two of the pieces are mortared in with a pale lime mortar, suggests that these were cut and went out of use in the middle ages, but their function remains obscure. The presence of tufa as blocking material suggests that the holes were filled at a time when vaulting was under construction - in this context perhaps in the first half of the fourteenth century.

2.8 The doorway to the north-west bay of the cloister

2.8.1 The remaining eastern jamb of the doorway retains holes for the pintles, the draw-bar, and probably a wrought-iron restraining bar, all relating to the medieval door-furniture. The three metal accessories have all been fairly brutally cut from the wall, leaving enlarged apertures bearing coarse chisel-

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<sup>12</sup> Attributed by Harvey to William Wynford, and therefore likely to have been begun by the 1380s. The 1420s cut off date is provided by the blocking of one of the newly traceried windows of the south transept by the erection of Bishop Bubwith's new library over the east cloister.



marks. The interior face of the doorway had a plain rebate 11 cm deep on the inner face of the inner order of the arched entry to the nave/north west bay of the cloister, against which the door may be presumed to have fitted when closed. The positions of the draw-bar and pintles in relation to this rebate, give some idea of the original thickness of the door: the southern edge of the draw-bar socket is 3.3 cm back from the rebate; the well-preserved southern edge of the upper pintle-socket is 5 cm back; and the scar of the lower pintle is between 5 and 6 cm back - therefore, the back surface of the door presumably lay approximately 4 cm back, since the ring of the hinge would have had some thickness projecting behind the rear face of the leaf.

- 2.8.2 The draw-bar socket lies between 125 and 136 cm above the present threshold, and is 12.8 cm wide x 11 cm high x 9 cm deep. This is clearly the shallow end of the seating for the draw-bar, and implies that not only the western jamb of the door but also something in excess of 2 metres of the masonry to the west of this must have been built to allow the draw-bar to operate - this almost certainly implies that the whole of the 7th bay of the aisle's exterior wall was constructed. It seems likely that the Phase 1 fabric would have been completed to the eastern edge or centre of Bay 8 in order to allow for the junction with the west walk of the cloister (which was clearly one of the priorities of the Phase 1 reconstruction); this would also mean that the design of the west front could have been deferred until the first half of the thirteenth century (or a little later) and that it may therefore have been influenced by the contemporary work at Wells.
- 2.8.3 The pintle sockets must have lain between approximately 50-54 cm and 202-207 cm above the present threshold. The lower position survives solely as the imprint of the under-face of the squared iron bar, running slightly askew into the wall, the whole of the rest of the orifice having been reworked in removing the wall-stub and leaving a hole 21 cm high x 19 cm wide x 14.5 cm deep. The full square of the upper pintle socket is preserved in the irregular hole cut for its removal: this was 5 cm high x 4 cm wide x 16 cm deep, the hole neatly cut and rectangular. Again the breaking out and cutting of the iron from the wall has left a larger hole 17 cm high x 16 cm wide and running almost to the back of the socket for the pintle.
- 2.8.4 The question of whether the door was a single or double leaf appears to be answered by the existence of a socket and groove towards the northern edge of the jamb, which appear to have been designed to accommodate a large hooked bar, presumably intended to hold the door open. This was secured at its upper end with a 3½ cm square sectioned bar running 23 cm into the wall, the base of the scar for which is still visible at the inner end of a roughly cut recess (again presumably a post-Dissolution hole cut to remove ironwork). Projecting this line outwards it is clear that this represented the upper end of the position of a shallow groove, generally about 4 cm wide (but with decay,

particularly down the northern edge, obscuring parts of its run), which then falls for 131 cm to terminate in a second horizontal groove. The latter is quite deep at its centre immediately beneath the vertical groove (up to 6.5 cm), running out to the edges, and dying away to the south after 14 cm, but still being present 20 cm to the north, beyond which the stone is broken. This groove has a very slight curvature, suggestive of having been cut by the abrasion of the hooked end of a bar swinging on its upper fixing-point. The vertical groove is set slightly askew, so that its base lies 4 cm north of its upper end - this presumably being the result of the slight off-centre hang caused by the L-shaped end of the bar. The way in which the groove at the base is longer to the north than the south is perhaps the result of the bar being dropped from its 'open' position to the north when the door was closed - the bar striking the wall at the edge of the inner chamfer at the northern end of the jamb, and slowing as it moved across the stonework to the south. Otherwise one might have expected the southward groove (which would presumably have accommodated the latched part of the bar) to be the longer.

- 2.8.5 Taking the overall length of the bar (at 131 cm), and adding in the distance from its fixing point to the presumed position of the back of the door (approximately 88 cm), would mean that the ring into which the bar dropped if the door was open against the face of the east jamb would have been some 219 cm from the hinges. This distance seems greater than the likely width of the door opening, however, since if the door were placed centrally in the bay (its eastern jamb being 205 cm from the west edge of the bay division between Bays 6 and 7, and the bays being regular at 590 cm) this would imply a door width of only 180 cm. Therefore, not only was the door a single leaf, but its restraining hook may have run to a point below or above the horizontal line of its hooked bar.
- 2.8.6 To the north of the socket for the upper end of the bar is a roughly rectangular area recessed by 8 cm from the face of the jamb and running 17 cm north of the rough cut for extracting the bar, and a minimum of 17 cm high, its upper and southern edges obscured by the damage entailed in extracting the ironwork. The back face of this squared recess has the same sort of rough tooling as the Dissolution period reworking, and is probably not the medieval surface. It seems highly likely that a rectangular metal plate of some sort (perhaps associated with the fixing of the bar) had been inserted here in the middle ages.
- 2.8.7 In the lower part of the jamb one further small squared recess exists (whose purpose is unclear) lying approximately one third of the way back from the rebate against which the door was placed [see record drawing].
- 2.8.8 In the internal angle of the north-east corner of the jamb the nook-shaft has been damaged by the creation of what appears to be a diagonal fixing-point

approximately 4 cm in diameter, and originally running perhaps as much as 19 cm south-eastwards into the stone. This lies well above the position of the iron restraining-bar on the adjacent jamb, but only a little above the position of the putative seating for a raking shore on the north elevation - could this be associated with the temporary pentice? A second possible seating exists just to the west of this, as a shallow circular recess.

2.8.9 At the top of the door jamb, immediately beneath the springing of the arch, lie a pair of rectangular recesses 5 cm wide, their position suggesting that they may be associated with supports for the centring of the door arch during construction - they resemble open versions of the square mortar patches at the springing of the window heads which have been interpreted in the same way elsewhere in this report.

## 2.9 Constructional features

### 2.9.1 The medieval repairs

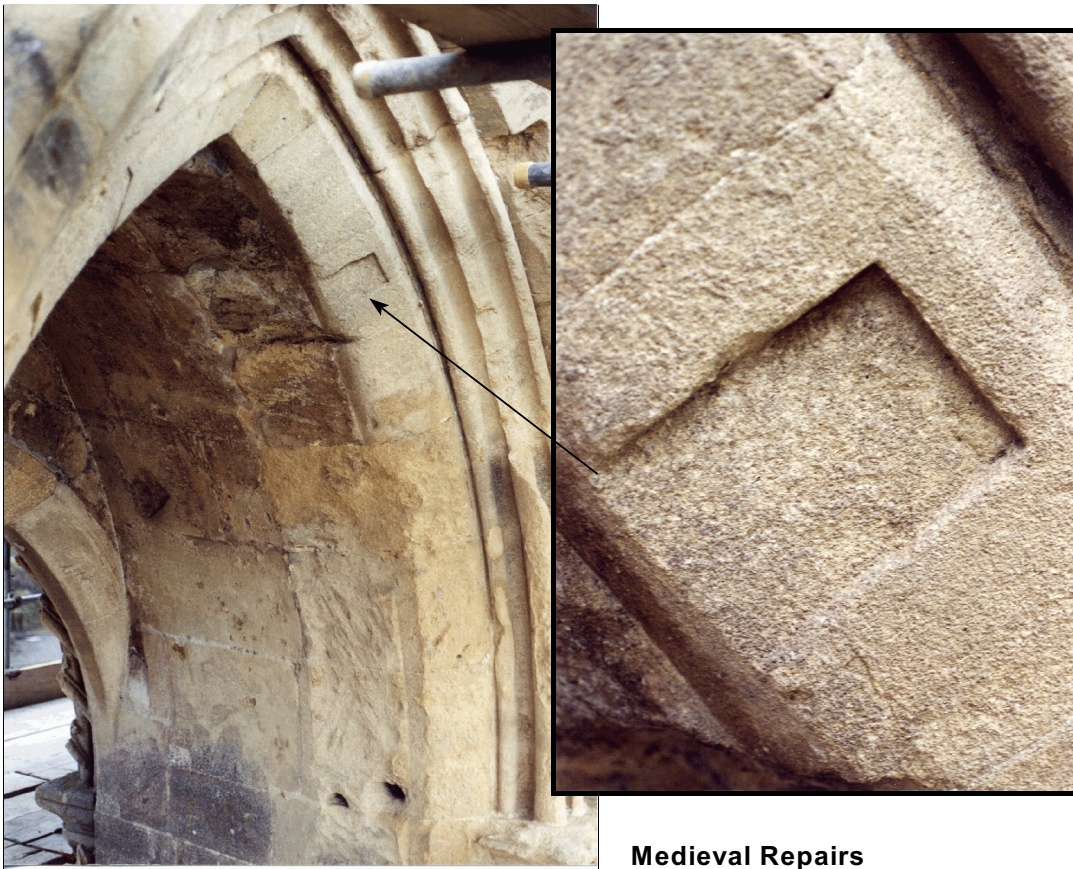
2.9.1.1 The stonework of the south nave aisle retains the imprint of ten original medieval repairs, all but one located on the exterior. The bulk of these (and certainly that near the base of the western nook shaft of Bay 3/4) appear to have been bonded with lime mortar, but one (certainly), and another probably, were fixed using hot mastic. Four of the repairs have lost their insert pieces, and in the parent stone of that on the western nook shaft of Bay 5/6 there are suggestions of reddening of the stone which may indicate over-heating of the block preparatory to the application of the hot mastic. In the case of the one identified internal repair - comprising a piece 10 cm wide x 23 cm high x 21.5 cm deep, set into the dexter bell of the vault-springer capital of Bay 6/7<sup>13</sup> - there is a clear line of pink stone along the lower margin of the parent block, making this a certain identification.

2.9.1.2 At Wells the introduction of hot mastic repairs can be fairly closely dated to c.1210, and this suggests either that the Glastonbury workshop was in advance of Wells by as much as 20 years, or that the hiatus between the completion of the wall base to the height of the cloister roof, and the setting of the vault-springer capital only 1 metre higher, could have lasted for 2 decades or more.

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<sup>13</sup> See entry No.10 in Appendix 1 - schedule of paint traces.





Above: lost mastic repair.  
Left: mastic repair at base of neck of capital  
Below: poured lead dowel in corbel, the lower stone of the repair lost exposing the end of the dowel. Pouring hole in side of block.



2.9.1.3 In Bay 5 there is an instance of a second form of medieval repair involving the use of a poured lead dowel. Here, the westernmost of the corbels has lost the lower half of the lower roll-moulding exposing a lead dowel which has an expansion at the point where the joint previously existed, and there is a lead pouring hole on the western end of the block, showing that the repair was executed before the block was fixed.

## 2.9.2 Masons' Marks

2.9.2.1 The ambient weathering of the stonework has erased most of the tooling and with it have gone the marks of the masons who worked the stone, these surviving only in the window heads where the sheltered position has preserved the tooling. Eight different marks (not counting a 'reversed' variant) have been found on this part of the Abbey ruin, there being a total of 22 stones bearing recognisable marks:

- the most common, found on all three remaining window heads [in Bays 4, 5 and 6], is a simple 'T' with the ends of the arms and stem crossed, there being seven instances: five in Bay 4, and one in each of the other bays

- a crudely cut 'X', also found in all three bays, may have a variant in which the ends of the X have been joined up to form a rough 'hourglass' or 'butterfly' - there being one instance of the latter in Bay 6, the main mark occurring 3 (perhaps 4) times in Bay 5 and once in the other bays.

- in Bay 6 are two 'N's, and a third reversed 'И' which was probably cut by the same man

- Bay 6 also has two instances of a mark which appears to consist simply of two parallel lines - '||'

- A mark consisting of a 'mitre' line drawn across on the corner of the block occurs twice on adjacent stones (immediately above the 'N' marks) in Bay 6, and resembles the mark of a Wells mason who worked many of the west nave triforium relieving arch voussoirs (probably in the 1230s)

- on the west side of Bay 6 is a 'P', two other fragmentary or partly erased examples of which may be present

- also partly erased, on the east side of Bay 6 is a mark which has

also been noted on the interior interlacing arcade of the lower elevation of the Lady Chapel,<sup>14</sup> consisting of a neatly cut 'A' with a horizontal bar at the top closed with short vertical lines, and the short cross-line v-shaped. A similar mark (though without the verticals on the top bar) occurs on the west nave triforium-level internal flying buttresses at Wells - though 45 years would appear to separate the latter from the Lady Chapel.

2.9.2.2 The most prolific mason, 'T', has not been noted at Wells cathedral, and neither has this particular form of 'P'; the rough 'X' is so simple to make that it cannot be regarded as specific to one individual - the same may also be true of 'mitre' and 'll'. Marks similar to 'll' are found at Wells on the eastern triforia of the transepts, under construction c.1180-90. 'N' and its reversed variant are also found beginning around this time at Wells, and the man who owned this mark seems to have been an established mason there, working into the early 1200s up to (and possibly beyond) the mid-nave break. 'Mitre' and 'A' could perhaps also span the mid-nave break at Wells.

2.9.2.3 Therefore, the masons' marks tend to agree with the form of tooling, block size, and use of hot mastic repairs in suggesting a date in the period 1210-20 for the resumption of work on the south nave aisle after the break at the top of the cloister wall. Perhaps the hiatus in work which seems to have taken place at Wells shortly after 1214 when the east nave was completed meant that the Abbey could regain control of Doultong quarry and engage some of the Wells masons. With work restarting around 1220 at Wells the lure of the cathedral's newly reestablished masons' yard may have attracted some of these men (and others from the established Glastonbury workshop) back to the west nave works there. The much reduced area of work in the spandrels above the window of Bay 6 suggests that the masons' yard at the Abbey may have been in difficulty at around this time.

### 2.9.3 Putlog holes

2.9.3.1 In many buildings the putlog holes (to accommodate the horizontal timbers of the original construction scaffolding) were often left open or with loose blocking stones; but other buildings concealed the holes behind facing stones. The south nave aisle at the Abbey appears to have used both techniques, since no holes have been certainly identified in the Phase 1 fabric of the lower wall, but

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<sup>14</sup> Twice on the western tympanum of the E bay, S side; once on the second tympanum of Bay 2 (S), as well as on the tympanum directly opposite on the N elevation. The other Lady Chapel masons 'E', 'mallet' and 'runic K' are not found on the nave.

the complete set of holes at window springing level were left open until relatively recently. The latter sequence of holes run right through the wall and must, therefore, be part of the original construction, rather than holes cut for later repairs, which would only have run far enough into the wall to anchor the scaffolding.

- 2.9.3.2 Above this level a second set of putlogs exists on the line of the apices of the windows (2 metres higher), all of which appear to have been blocked in 1912. This lies higher than the medieval half-lift might have been expected, and also appears to be higher than the blocked putlog holes on the interior of the aisle roof, which lie immediately above the off-set. These interior holes may, therefore, be survivors of the intermediate lift which does not show on the exterior (south) elevation of the wall. The north elevation also preserves at least one of the lower putlog holes, at 2.8 metres below the springer level lift, but the intermediate half lift seems not to be represented.
- 2.9.3.3 The presence of (albeit only a few) putlogs on the upper masonry of the south aisle, and their apparent absence from the lower Phase 1 masonry, may prove to be one of the defining characteristics of the break between the two campaigns of building.

## 2.10 The rainwater goods

- 2.10.1 That rainwater management was a concern of the Abbey from an early period can be seen from the incorporation of rainwater ducts into the walling of Abbot Monnington's extended east end, as well as from the regular series of strap fixings for large down-pipes evident on the east walls of the transept.
- 2.10.2 The two major baulks of masonry surviving from the fourteenth century east end on the line of the choir arcades each preserve in their eastern elevations the course of a square channel lined with Douling stone ashlar set within the buttresses towards their outer faces, which slope outwards a little above the level of the plinth string-course, and which presumably discharged rainwater from the roof of the retrochoir either direct or through a lead chute. The buttresses of the fourteenth century work at Exeter Cathedral contain similar internal rain-water channels.<sup>15</sup> The east walls of the north and south transepts, against the angle with the choir, both possess regular series of drilled holes, in paired sets of three, which must represent the fixing-points for the series of straps which fixed the lead down-pipes to the wall. While it is impossible to be

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<sup>15</sup> Peter Bird, Exeter Cathedral architect, pers. comm..

certain of the date of the fixings on the transepts, the incorporation of the rainwater chutes into the structure of the east end shows that by the time of Abbot Monnington (1342-75) sophisticated measures for rainwater management were the norm for the abbey.

- 2.10.3 The evidence of the south nave aisle provides some further insight into the dating of the provision of rainwater goods, since it is clear that two systems have been installed here, and that the earlier system must have predated the insertion of the flying buttresses - erected either as part of the renewal of the cloister under Abbot Chinnock (1375-1420), or at (or shortly after) the vaulting of the nave roof (the eastern part under Abbot Fromond (1303-22), the western under Abbot Adam de Sodbury (1323-34)). A date in the early fourteenth century would seem likely from the circumstantial evidence of the building, since the Galilee chapel (built under John of Taunton, 1275-91) appears to have been constructed with conventional water chutes throwing the rainwater away from the wall, but not confining it within pipes.<sup>16</sup>
- 2.10.4 Much of the top courses of the south elevation of the south nave aisle wall has been interfered with or renewed, but at the apex of the buttress between the two eastern bays [Bays 3/4] a narrow sloping channel 11 cm wide x 16 cm high and with a maximum depth of 14 cm, has been cut into the upper half of the top central stone. Vertically beneath this the hood-mould string-course has an 18.5 cm wide recess (with slightly curved edges) cut through its full depth at the centre of the buttress - the implication being that a rainwater pipe had been inserted down the building at this point. There are traces of iron fixings to retain the pipe below the string-course, where two iron pins survive to the dexter of the centre-line of the buttress, and there is damage to the joint commensurate with the rusting of similar pins to sinister of centre. Two courses above the string-course there is damage along the bed joint which could also be associated with rusting iron pins.
- 2.10.5 However, below this the flying buttress erected in the later fourteenth or early fifteenth century occupies the centre line of the buttress, and it seems unlikely that this lead pipe and the flying buttress could have co-existed.
- 2.10.6 While no other central chutes have survived at the apices of the other buttresses, there is evidence that each of these originally accommodated a

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<sup>16</sup> It seems likely that at Glastonbury (as at Wells) the twelfth century aisle roofs did not have a parapet, but rather were provided with dripping eaves - the fossilised drip-course of that at Wells can be seen on the north nave aisle against the west front. The down-pipes would therefore appear to be associated with the provision of a parapet (?under Fromond and Sodbury as part of the vaulting of the nave) prior to the erection of the flying buttresses during Chinnock's abbacy.



central lead rainwater pipe. The buttress between Bays 4 and 5 has an 18 cm wide slot cut through the hood-moulding level string-course, and above this is an iron pin and empty hole with iron expansion damage to sinister of centre, with a cement patch covering the likely dexter position of the fixings. Below the slot through the string-course is a round-headed iron nail which retains a torn layer of lead beneath it, presumably a remnant of the lead strap to secure the down-pipe.<sup>17</sup> The buttresses of Bay 5/6 and 6/7 both have relatively wide slots cut through the centres of the hood-mould level string-course, with traces of iron pins in the bed joints one or two courses above; in Bay 5/6 there is a vertical mortar ridge 32 cm long on the centre-line of the buttress which could derive from the fixing of the back of the lead down-pipe to the wall.

- 2.10.7 On each of the four remaining nave aisle buttresses, however, a second (narrower) aperture has been made through the hood-mould string-course to one side of the centre-line, and associated with this line are several pairs of small (usually filled) circular drilled holes. These would appear to be the surviving traces of a second, later, set of rainwater down-pipes, of somewhat narrower diameter, presumably installed at the time when the flying buttresses were inserted, probably as part of the work of renewing the cloister. In all instances the line of these down-pipes lies just outside one edge of the buttress springer blocks, and in each case the cut through the string-course is 8 cm wide, the edge of the cut showing that the pipe was circular in section. The two eastern pipes ran to the east of the buttresses; the two western ones to the west.
- 2.10.8 As far as can be judged the fixing points for the earlier set of drainpipes lay a little above the hood-mould level string-course, and the lack of any clear sets of fixings on the wall below the string suggests that these may have been destroyed in the process of inserting the flying buttress springers, suggesting that there were two sets of fixings at regular intervals. At the base of the buttress between Bays 5 and 6 there is a mortar pad on the top of the cloister roof-level string course, which may be the surviving seating for the shoe of the early drainpipe. The later series of drainpipes were probably fixed in a similar way, with one strap above and two below the window-head string-course - this is the pattern in the best preserved series on the buttress of Bays 5/6, and the other (probably incomplete) sets appear to approximate to this ideal. The later pins were set in drilled holes generally 11-15 cm apart, 1.7 cm in diameter and

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<sup>17</sup> This fixing and its companion are shifted significantly to the east from the centre-line of the buttress, as if the pipe were moving to avoid the flying buttress beneath - though this does not appear to have been the case in the other bays. Were the buttresses added piecemeal? Did Glastonbury have the same sort of problems as Salisbury with the central tower, requiring the addition and alteration of the buttressing of the nave? For the latter see Morris 1996.



### The Medieval Rainwater Goods

Left: The rain-water chute at the wall-head, closed off with Caroe period repairs

Below: The two cuts through the window-springer level string-course - that to the left for the first down-pipe; that to the right to accommodate the pipe after it was moved eastwards to avoid the new flying buttresses.

Bottom left: the lead straps securing the down pipes were held by two iron nails in wood plugs, only one of which still survives (bottom right), retaining a fragment of the lead strap beneath the round head.







**Rainwater management elsewhere on the great church.**

Above: the north (right) and south (left) transepts had lead downpipes fixed to the wall adjacent to the side walls of the choir, each strap having three fixings to either side, the sets of six holes still clearly visible, with slots cut through the string-course. Above the south transept downpipe the curved water channel carrying off the water from the SE angle of the tower is preserved.

Left: Abbot Monnington incorporated vertical water channels in the thickness of the eastern buttresses of the retrochoir, which discharged just above the plinth string-course.



10 cm deep; the earlier ones appear to have been simply driven into a convenient bed joint.

## 2.11 The changes in the form of the parapet

- 2.11.1 It has already been noted that the projecting parapet stones appear to oversail and seal the chutes which fed the rainwater pipes, raising doubts as to the status of the uppermost course of the south elevation of the wall. Taken with the difficulties encountered in identifying the true extent of the rebuilding of the wall top carried out by W.D. Carøe in 1912 [see Section 3.2. below], this makes the evaluation of the changes in the form of the parapet particularly difficult to interpret. However, these changes, if original, have considerable implications for the phasing of the construction of the south nave aisle.
- 2.11.2 At the eastern end of the surviving elevation the buttress between Bays 3 and 4 has a quite different upper termination to that of the remaining buttresses of Bays 4/5 to 6/7. Here there is a double moulding on the horizontal string which terminates the buttress, positioned lower than the parapet base-stones further to the west and turning upwards at the western margin to join the latter. The reduced height of the string is also reflected in the positions of the capitals of the nook-shafts framing the buttress, which are a course lower and of a most unusual design. Instead of the conventional stiff-leaf capitals, their volutes reflecting the shape of the square carving block, these two capitals are simple foliate adaptations of the corbels which form the rest of the corbel table, so that their end elevations have the same double roll with narrow keel between. The stiff-leaf at the bases is fairly rudimentary, but the stones appear to be original, and in situ, since the keel of the attached shaft beneath is carried up onto the neck of the 'capital'.
- 2.11.3 This part of the fabric seems to conform to the general criteria of the post-1189 building style, though interestingly the block sizes here are significantly smaller than in the bays to the west. In the ashlars above the 1189 break line flanking the west jamb of the window in Bay 3 the average bed height is 26.56 cm, and to the east of the east jamb of the window of Bay 4 the average is slightly less, at 24 cm. To the west, however, the average post-1189 bed-heights are between 32 [Bay 6 W] and 35 [Bay 5W] cm., suggesting that there was a further hiatus in construction at the east jamb of Bay 4. Further contributory evidence for this break is provided by the change in the level at which the rubble walling reduces in thickness on the northern elevation: the core-work of Bay 3/4 maintaining its full thickness to approximately 70 cm above the level of that in of the western bays.



The change in the form of the capitals at the base of the parapet: in the eastern bay the foliate capital has merged with the form of the corbel-table (above); further to the west conventional capitals are used, the foliage similar to that of the north porch at Wells (left).



Left: the ends of the beams forming the early cloister ceiling were seated in shallow rectangular recesses in two rows.

The heavy corbels to support a wall plate (just below the drip-course) are later, but the early roof must have been seated at the same height. The two rectangular recesses relate to the cloister of Abbot Chinnock. The area of masonry at lower left is a post-medieval repair post-dating the destruction of the cloister, since it does not bear the pecking for fixing the cloister's attached shafts.

- 2.11.4 A change of this magnitude, where the whole form of the parapet changes, and the bed heights increase by between 6-11 cm, suggests another major hiatus in the progress of the building. It is possible that this hiatus is associated with the completion of the transept's western wall and the provision of the base of the central tower, since medieval (and later) building programmes on great churches usually included parts of the eastern walls of the nave to provide shoring against the high work of the crossing and transept. At Wells this break occurs between the second and third bays of the aisle, and the same appears to be the case at Salisbury; at Glastonbury, however, where a flight of steps appears to have existed in the first bay of the nave, it may have been necessary to increase the extent of the nave abutment required to stabilise the crossing.
- 2.11.5 The second change in the form of the parapet base is much more minor, and appears to be associated with the brief period of building in upper lias ashlars at the top of Bay 6. Here the whole of the corbels beneath the parapet are cut to a slightly different moulding, eschewing the keel between the rolls in favour of a 45° flat.
- 2.12 The scars of the cloisters
- 2.12.1 There is evidence on the south elevation of the remaining section of the nave wall for two successive north cloister walks. In the second edition of his *'Architectural Handbook of Glastonbury Abbey'*, written in 1910, Bligh Bond noted that

'Recent excavation has also shewn the bases of the responds which stood against the walls dividing the bays, and the marks of the rivets or cramps by which the upper parts were attached are visible... The lines of their arches can still be traced against the aisle wall, and at the apex of each is a little sinking for a boss. The curve of the ribs is shewn by the grooves visible, and there are remains of the cement fillings behind still adhering..'<sup>18</sup>

These traces belong to the cloister of Abbot Chinnock, the earlier cloister being represented by

'The two rows of shallow square sinkings which run all along this wall... [and which] shew the position of the rafters and gutter beams

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<sup>18</sup> Bond 1910, p.68-9.

of the older wood-roofed cloisters which Abbot Chinnock's work superseded<sup>19</sup>

- 2.12.2 This early cloister is represented by the double row of shallow joist-pockets, centred 75 cm vertically apart, which run from just east of the nave doorway to the end of the surviving ashlar in Bay 3 of the nave. These sockets are centred an average of 56 cm apart (ranging from a minimum of 53 to a maximum of 58 cm), and many have been infilled with a pinkish-brown mortar resembling that associated with both the later cloister and the flying buttresses. Where this mortar is absent, and the holes are empty, it is clear that the sockets are quite shallow and are wedge-shaped, running out towards the top, like the smaller and less frequent sockets on the lower part of the north elevation of Bays 7 to 5.
- 2.12.3 These sockets suggest that the early cloister possessed a timber roof, probably supported on an arcaded stone-built pentice. There is a difference between the sockets of the eastern and western parts of the north walk, in that up to just over half-way across nave Bay 5 they measure 14 cm wide, while from this point westwards their width rises to between 18 and 22 cm - probably indicating two phases of construction.<sup>20</sup>
- 2.12.4 At 160 cm east of the opening of the nave doorway the double row of joist-pockets ceases, and on this line, 120 cm higher up the wall, is an open joist pocket 30 cm deep, with a second 36 cm deep pocket at the same height above the eastern door jamb. These two holes probably represent the height and eastward extent of the north-western bay of the first cloister, and may also denote the line of the eastern wall of the early west cloister walk. This line lies between the western bay division of Chinnock's north cloister walk and the respond of the arch at the eastern margin of its north-west bay; this suggests that Chinnock's master mason could have rebuilt the cloister piecemeal, a walk at a time, as was later done at Wells.
- 2.12.5 The upper set of joist-pockets lie 225 cm below the roof-line of the cloister as defined by the string-course at the base of the window sills, implying the presence of a steeply pitched roof over the pentice walks, but there are no indications of the position of the roof-joists' upper ends beneath the string-course, nor of supports for an early wall-plate, the existing supports clearly being insertions and presumably belonging to the second cloister.

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<sup>19</sup> Ibid. p.69.

<sup>20</sup> And perhaps reflecting the extent of construction in the south aisle to the planned break at the western margin of Bay 4.

- 2.12.6 The later cloister - attributed to Abbot Chinnock - was of a more convention type, divided into bays (two to each bay of the nave), with stone vaulting supported on wall shafts of which the bases still remain. Bligh Bond's season of excavations in 1909-10 was the first to concentrate on the monastic buildings, and exposed small parts of the eastern end of the north cloister and almost the whole of the east walk. He exposed the mortar bedding of the floor and several areas of in situ stone paving, though the plentiful fragments of encaustic tile convinced him that the floors were originally tiled.

'On the floor level as indicated by the mortar bed, was a narrow layer of dirt, such as might have accumulated through neglect, and over this came the final tale of ruin in the shape of broken remnants of window glass, once richly painted, but now disintegrated, and for the most part too far decomposed to transmit light.

'Above and around these fragments, a little more earth, and then the dust and chaos of the last collapse, from which a wealth of architectural fragments has been recovered.'<sup>21</sup>

The examination of these fragments, taken together with the results of the excavation enabled Bond to picture the later cloister as

'In character not unlike those of Wells, yet vaulted with greater richness and profusion of panel-work: their windows finely traceried and filled with glass of great magnificence, the walls opposite decorated with a sunk panel-work agreeing in character with the vaulted roof.'<sup>22</sup>

- 2.12.7 There is no evidence for such panelling against the north wall, but this wall does preserve all the remaining evidence of the internal elevation of the second cloister in the form of the fixings by which Chinnock's builders attached the new structure to the twelfth century south aisle wall.

- 2.12.8 In each bay of the cloister, on the vertical line of the surviving pier bases, and at varying heights, are two or three pinning-points where (presumably) iron fixings have been run horizontally into the twelfth century masonry to fix the blocks of the wall-shafts. The upper of these positions is sometimes occupied by a squared stone insert, and in one instance an open socket, suggesting that a different form of dowel was used to secure these blocks. This upper position seems to mark the capital block since, in addition to the fixings, patches of

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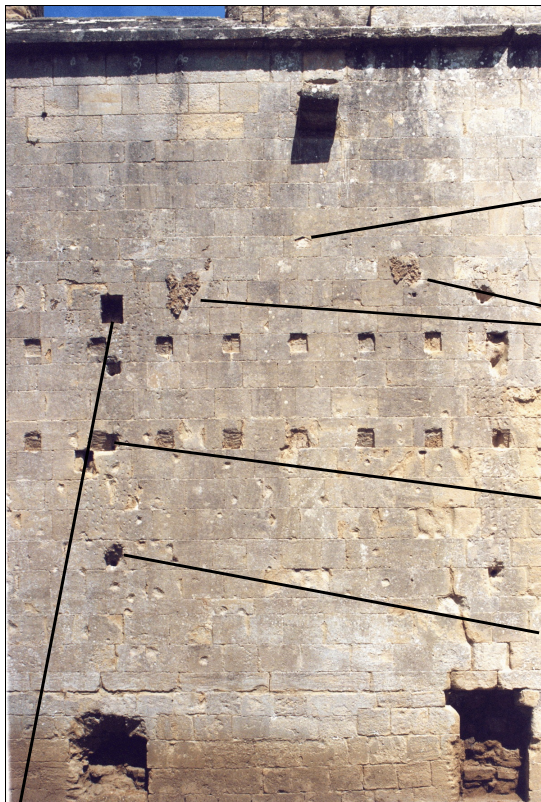
<sup>21</sup> Bond 1920, p.69.

<sup>22</sup> Ibid. p.69-70.

pinkish-brown mortar still adhere to the wall, both on the line of the wall-shafts and also marking the positions of the wall-plate where the vault web abutted the nave wall, the latter being best preserved on the two surviving eastern bays. The curvature of the ribs implied by these patches of mortar indicates both a springing point near the upper pinning points, and an apex at the small pentagonal inserts which lie at the centre-line of each bay just over a metre above the springers. These small inserts fill shallow depressions in the wall-face, and appear to preserve the points at which the ridge rib of the vaulting met the aisle wall.

- 2.12.9 Bond wrote that the '*curve of the ribs is shewn by the grooves visible*', but no such grooves can now be detected on the stone, and only the mortar patches preserve the position and curvature of the ribs. These patches appear to have been shed relatively recently in places, where the colour of the stone is lighter, and it is clear that the surviving evidence for the form of the second cloister vaulting is being weathered away. It would be of great value to record these patches accurately for each bay, both to preserve the evidence which does remain, and to allow the record for each bay to be combined by being overlaid to form a composite which should provide a much more accurate line for the vault position.
- 2.12.10 There are mortar patches also on the line of the wall-shafts, and here also are traces of 'pecking' of the surface of the twelfth century ashlar to provide a roughened surface to assist the bond of the mortar. Above the presumed position of the capital in each bay there is a further socket, probably intended to locate and support the tas-de-charge. It is clear from the surviving evidence that the second cloister was virtually freestanding, relying on the stability of the wall-shafts (lightly pinned in position) to support the vaulting, and that the shallow sockets for the ridge rib could have provided no support and were no more than locating points.
- 2.12.11 At the western extremity of the north walk, near the eastern jamb of the nave, and opposite the line of the pentice wall of the west walk excavation has exposed a larger base block, and there are four pinning points at capital/springer level on the same vertical line. Evidently this marked the position of the respond for the eastern arch of the north-western cloister bay, and when this was inserted it appears that the nave door's label stop was cut out, since this position now contains a piece of moulded ?Dundry stone with limewash on the surface, fixed with a brown mortar similar to that used elsewhere in the cloister structure.
- 2.12.12 Centred about 1.3 metres above the apex of the vaulting was a series of inserted corbels designed to accommodate the wall-plate of the cloister roof, and having a shallow groove to locate the timber across their top surfaces. Only the three western corbels survive, with the positions of three more





Marks of the C15 Cloister

Socket for ridge rib of vaulting

Mortar pads for fixing the wall-ribs

Fixing for capital

Fixings for wall-shaft

Socket for upper vault member





indicated by later blockings, and the other positions destroyed by the decay beneath the windows. These formed a series around 2 metres apart, though this distance appears to have varied considerably, and they do not form a sequence which relates to the bay divisions of the second cloister. It is clear that they are inserted and not part of the twelfth century structure, but it is nonetheless possible that they were inserted as part of the first cloister and reused by the builders of the second.

- 2.12.13 The roof which covered the cloister was evidently of lead, since beneath the sill-level string-course, driven up into the angle with the wall-stones beneath it, lies a series of round-headed nails beneath which remain several trapped fragments of lead. These nails (generally driven at approximately one foot intervals) resemble the surviving example of those used to secure the lead drainpipes, probably indicating that they belong to the second cloister roof. Also noted on the ashlar of the top few courses of the wall beneath this string-course were a number of mortar patches and stubs of nails, but no meaningful distribution pattern could be identified for these. It is evident that the lead sheet of the cloister roof was turned down beneath the string-course, however, and it is possible that these nails and mortar patches were associated with fixing its lower edge.
- 2.12.14 In describing the two cloisters one set of sockets in the south nave aisle wall remains unattributed, this being a sequence of holes set just below the lower of the two sets of joist-seatings for the early cloister roof, and apparently unrelated to the spacing of the structural elements of either cloister. Of the ten examples all but two have been infilled; their spacing is irregular, but they are generally around 2 metres apart. Beneath the centre of Bay 5 one of these sockets lies on the line of a second cloister wall-shaft, proving that they could not have been in use while the latter stood. It is perhaps possible that they are putlog holes for a scaffolding, but they do not resemble those putlogs which have been identified from the medieval construction, nor do they appear to relate to the positions of those in the wall above.
- 2.12.15 Towards the base of the wall, just 50 cm above the tops of the extant wall-shaft bases, a clear horizontal line exists on the wall, running for the whole length of the surviving ashlar-work, and interrupted only by the area of post-medieval refacing in Bay 4/5. While it is possible that this is no more than the mark of the old ground-surface established after the destruction of the Abbey, it is tempting to suggest that it could mark the bench-line of the first cloister, and that the floor-level of the early cloister lay higher than that of its replacement.<sup>23</sup>

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<sup>23</sup> Excavations on the line of service trenching in the 1990s may, however, have identified two floor-levels for the cloisters, with the early cloister floor **below** that of Abbot Chinnock's cloister [Charles Hollinrake, pers. comm.].

## 2.13 The inserted flying buttresses

2.13.1 Probably associated with the construction of the second cloister is the insertion of flying buttresses behind the aisle vaulting and spanning the cloister walk. The 1909-10 excavations appear not to have uncovered the foundations of the buttresses between the bays of the north walk of the cloister, but these should be larger than those of the other walks in order to carry the additional abutment. The surviving stones of the buttresses within the aisle wall are clearly insertions, each consisting of two upper and one lower block fixed with the pinkish-brown mortar associated with the cloister campaign and having oyster shell gallets.

2.13.2 Above the upper inserted stone, and below the lower one, are slips of lias (or patches of brown mortar of similar shape), whose function is uncertain. The exposed faces of the buttress springers have been cut with shallow channels to assist the bonding of the mortar; in several instances the pinkish-brown mortar still adheres to the stone, and in Bay 6/7 lias gallets still remain embedded in the mortar.

## 2.14 Polychromy

2.14.1 During the 1989 survey several areas of remaining paint traces were noted, the most important being the red on white ground observed (partly concealed by sheltercoat at that stage) on the soffit of the window reveal in Bay 4, and red ashlar line traces on a white ground beside the wall-plate to the west of Bay 4 above the springing of the window head.

2.14.2 During the current survey the survival of paint in the arch-head has been confirmed, but the ashlar lining has not been relocated. When Wells Conservation Centre carried out the conservation and repair of this section of the ruin in 1989 it no longer employed any of the Wells Cathedral West Front trained staff, and was being run commercially by a manager with limited experience of external limestone conservation, and using sub-contracted labour, so that despite the credentials and high expectations associated with the brand-name the work was not necessarily of the highest quality. It is known, for instance, that painted decoration was cleaned off during the water-washing of the south-eastern crossing pier in the previous season's work.

- 2.14.3 Inspection of the stonework has identified at least two, and probably three or more phases of decorative finish on the interior. The relationships between these systems can be identified in the arch-head of Bay 4 and on the attached nook-shaft of Bay 6. The earliest system surviving appears to have been applied as a thin ground over the stone to which red painted decoration was added in places. This thin ground coat can be identified on the soffit of all three surviving complete window arch-heads, but only on the eastern [Bay 4] does any red pigment remain. If the implication of the dates of the vaulting springers (that the two western bays of the remaining section of the nave wall were only completed in the first half of the fourteenth century) are correct, then it may be either that the finishes in the eastern and the two western bays are of slightly different dates, or that both represent an early fourteenth century repaint applied when the *ecclesia major* was completed. Alternatively the absence of red pigment on the two western bays may be an indicator of their later date.
- 2.14.4 In Bay 4 the painted decoration on thin white ground is overlaid by a pinkish wash, and perhaps also a third limewash or ground coating, suggesting more than one repainting prior to the Dissolution. In addition, a thicker plaster coating appears to have been applied generously over the interior at a later date than the thin ground-based decorative schemes, since on the nook-shaft in Bay 6 there are thin traces of ground on the eastern side of the shaft just below the capital, while below this, and apparently overlying it, is the much thicker plaster layer which is found generally in the inner angles of nook-shafts, wall-plates, and (less commonly) vaulting-rib roll mouldings.
- 2.14.5 The survivals of this latter material in the deep angles suggests that this was a much thicker white plaster layer, and it is likely that it is the failure of the adhesion of this material, following its exposure to the elements, which has stripped all trace of decoration from the walls.<sup>24</sup> As yet no pigments have been found overlying it. If the thinner ground-type finish dates from the early to mid fourteenth century, then it seems likely that the thick plaster finish belongs to the fifteenth century.
- 2.14.6 During the examination of the Lady Chapel decorative scheme in 1995 it was noted that the ground/red ochre type of decoration was not found in the Lady Chapel but was present in the Galilee (built towards the end of the thirteenth century). This observation would tend to support the attribution of the similar technique found in the nave to the early fourteenth century, rather than the beginning of the thirteenth.

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<sup>24</sup> It would be of interest to know the composition of this material, since it appears to be a fairly pure white, and without a coarser substrate.



Above: two details of Area 11 (Bay 4/5, vault springer) - possible traces of red ashlar-lining on the vault web. Left, a more diffuse patch; right, a possible (discontinuous) ashlar line.

Left: detail of Area 15 (Bay 4, soffit of window head) - residue of red paint on white ground.

## 2.15 Unexplained features

2.15.1 In addition to the holes cut in the jambs of the window in Bay 5 (discussed above in relation to the windows), there is a series of squared recesses cut in the faces of the surviving base mouldings immediately beneath the water-holding bases of the window nook-shafts. These are found in every surviving instance from Bay 3 to Bay 6, but seem not to be present in the eastern base of Bay 7.

## 2.16 The Dissolution

2.16.1 It is clear that at or soon after the surrender of the Abbey the building was thoroughly stripped. Iron-work has been painstakingly (if brutally) cut-out of the walls, with the pintles and iron bar of the cloister door excavated from the door jamb. The lead of the cloister roof and the drainpipes must also have been stripped, leaving only small fragments trapped behind the occasional nail.

2.16.2 It is suggested above that the damage around the aisle windows relates not the brutal removal of the glazing, but rather to the late medieval insertion of new window tracery; but, even if this is correct, the destruction of the tracery suggests that the glazing was removed and with it the whole of the inserted stonework, none of which now survives.

## 3 The Post-medieval fabric

### 3.1 Post medieval repairs

3.1.1 At the base of the south elevation of the nave aisle wall, from the mid-point of Bay 5, and running back to the western edge of Bay 4 is an area approximately 2 metres high and just over 4 metres long which has been refaced in weathered Douling stone. At first it is tempting to associate this with the blocking of a recess created as part of the first cloister, prior to the creation of the early fifteenth century cloister by Abbot Chinnock; however, close examination shows that the blocking stones bear no sign of the imprint of Chinnock's masonry - there is no pinning, mortar or pecking of the surface to

receive the wall-shaft which would have passed over the eastern end of this area. Indeed, the pecking of the stone for this fifteenth century cloister wall-shaft exists on the late twelfth century masonry above the refacing, but it is not present on the renewed stonework, indicating that this repair must be post-medieval, dating from a time when the second cloisters had already been demolished.

3.1.2 The prospect of the ruin from the south from Stukely's *Itinerarium Curiosum* of 1723 appears to show a void at the base of the nave aisle wall in the position corresponding to the refaced area, suggesting that in the early eighteenth century this was a patch of lost ashlar, subsequently repaired to prevent further collapse in the wall above.

3.2 The 1912 campaign of repairs under W.D. Carøe

3.2.1 Following the purchase of the Abbey, and drawing upon the finances raised by the appeal launched in 1907, the stabilisation of the ruins was entrusted to W.D. Carøe, one of the leading conservation architects of his day. Carøe's work at the Abbey between 1909 and 1917 included quite large-scale reconstruction, as, for instance, in the addition of a whole bay in the north wall of the Galilee, and the erection of a new south-west corner turret in the Lady Chapel. These repairs represent the stabilisation of the ruin in areas where subsidence appears already to have been active. Carøe seems generally to have been at pains to make his work easily distinguishable from the medieval fabric, though in the intervening 90 years the weathering of the modern surfaces has softened the difference between the two sets of Douling ashlar-work. He tended (as in the Galilee) to leave new decorative elements such as capitals as plain carving blocks, making these readily identifiable as restorations. He also incorporated date stones (such as those inscribed '1912' on the nave aisle window sills) in his restorations.

3.2.2 In both Lady Chapel and Galilee he raised the heads of the walls to the level of the course above the corbel table (its projection serving to help protect the walls below from direct wetting), leaving a horizontal upper margin to the ruins which could then be capped off - this is clearly visible both on the building itself and on Carøe's drawn reconstruction of the south elevation of the structures, where the careful tinting of the stonework shows what survived and what was added. It seems likely that the same philosophy was employed in 1912 in his finishing of the top of the south Nave aisle wall, since, despite the way in which the stone has weathered in, it seems likely that almost (if not) all of the



projecting stones above the corbel table are renewals.<sup>25</sup>

3.2.3 In considering Carøe's repair philosophy (and his disagreements with the SPAB) Freeman notes that,

'The SPAB asserted that repairs should be clearly distinguishable in the structure of the buildings and not deceive the onlooker by a 'counterfeit of old work'. Carøe on the other hand felt that it was 'impossible to deceive the future by a make-believe of the past'. 'Let there be', he declared, 'no truck with the foolish fear and fallacy that modern work must tell its own story lest the elect be deceived. Modern work will tell its own story anyhow and anywhere, however well done.'<sup>26</sup>

In terms of the major renewals at Glastonbury this is certainly true; however, in matters of detail it is often difficult at this remove to certainly identify Carøe's interventions, and this must have been implicitly acknowledged by Carøe himself:

'Much of his conservative repair work became almost indistinguishable from the old. He used to say that the highest praise on completion of a job was when a parishioner would ask, complainingly, 'How on earth have you managed to spend all that money when there is so little show for it?' He disliked discarding redundant parts of a building. Phrases like 'old window reused' and 'existing paving reset' pepper his drawings and tantalise the observer now that three-quarters of a century of wear has blended his own with pre-existing work.'<sup>27</sup>

3.2.4 Carøe, therefore, was very likely to reset old block if it was available, and this appears to have been done at the west end of the south elevation of the nave wall above the level of the window in Bay 7, where the westernmost stones have a different surface morphology to the rest of the spandrel, they appear to be set (rather than pointed) in cement, and they bear diagonal (rather than the expected vertical) tooling. In most instances Carøe's repairs in new block can be distinguished by the larger grain size and more open texture of the early

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<sup>25</sup> The instances of surviving chutes for the rainwater pipes (which survive at the tops of the plain ashlar of the buttresses) in all cases are blocked by the projecting parapet course, making these certain to have been renewed or reset.

<sup>26</sup> Freeman 1990, p.147, quoting Carøe 1902.

<sup>27</sup> Ibid. p.147.



twentieth century Douling stone, and by its more regular decay patterns, but where he has reset medieval Douling stone brought from elsewhere on site this is particularly difficult to differentiate from the surrounding original fabric.

- 3.2.5 The precise pattern of renewal on the top of the south elevation of the south nave aisle is particularly difficult to unpick, and this is an area where the implications of the form of the wall-top - if medieval - are particularly important. It seems likely that the series of corbels in Bay 6, and probably the whole of the three upper courses of the wall here, are Carøe's work, since all of the corbels lack the central keel between the rolls, having a simple flat between them - the two flanking bays both have the conventional keel.<sup>28</sup> Coney's 1817 drawing of the great church from the west also suggests that the upper courses (particularly of the eastern end) of the nave aisle may be a later reconstruction, since there is very little stonework in his engraving appearing above the window heads.
- 3.2.6 Much more straightforward to identify are the large repairs to the sills of the windows, each of which bears the date '1912' incised into one of the new blocks of the northern face. Photographs of the nave prior to the restoration show that the sills were heavily overgrown, and it seems likely that the extent of disruption to the stonework beneath this foliage was such that Carøe felt it necessary to rebuild the sloping ashlar in order to remove the active roots and to prevent (or at least limit) water ingress to the core beneath. The foliage in these photographs obscures the extent of damage and disruption which Carøe was faced with when the ivy was removed, but he clearly rebuilt not only the sloping sills of all three windows, but also parts of the ashlar face-work beneath. Coney's 1817 engraving shows foliage on the sills and areas of disruption on the north elevation beneath (certainly) the two eastern sills. Carøe's repairs cover virtually the whole of the north-facing sills and two or more courses of the wall beneath on the two eastern bays, the new work ignoring the form of the sill-level string-course. However, these repairs to the wall face utilise what appear to be salvaged ashlars, so that they have blended into the old fabric. On the south elevation, also, nearly the whole of the sills are renewed, with the repair extending onto the plain ashlar beneath, and in the case of the western bay comprising almost 6 square metres of renewed facing.
- 3.2.7 Elsewhere the 1912 campaign has renewed only a few stones, most obviously at the tops of the buttresses on the south elevation, and in the upper lias ashlar area of the spandrels and buttress head of Bay 6.

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<sup>28</sup> Many of the corbels are now damaged and weathered, so it is possible that they are a medieval variant, exhibiting further evidence that the builders were working a bay at a time.

- 3.2.8 In addition to the repair of the ashlar work, Caröe also stabilised and refaced areas of exposed wall-core and rubble-work. In the upper works of the north elevation of the south nave aisle, where rubble work backs the ashlar at the top of the wall and the base of the parapet, there is a dark ashy lime mortar used in the rebuilding of the wall top and the reconstruction of the eastern end of the wall core, all of which can probably be dated to 1912.
- 3.2.9 Also belonging to Caröe's campaign of repair is the use of roughly squared, coursed lias rubble, utilising quite large stones to face exposed core-work - which is a major characteristic of the lower parts of the south elevation of the south choir aisle. This style of repair is found on the end elevations of the south nave aisle, particularly at the sides of the repair work. At the east the central part of the end elevation is a mixture of refacing in marlstone and the original marlstone core work pointed in hard cement. Caröe has also used marlstone (usually in larger blocks than the medieval work) in the projecting area of corework at the east end of the wall.
- 3.2.10 The use of squared lias rubble also appears in the upper parts of the projecting rubble work above the vaulting springers. In the western two such rubble projections Caröe's reconstruction has ignored the way in which the medieval lias forms the voussoirs at the base of the lost internal flying buttress beneath the triforium roof.
- 3.3 Post-Caröe repairs
- 3.3.1 Pointing in a hard Portland cement mix, of the type commonly found in pre-Second World War Ministry of Works campaigns of repair and pointing, has been applied generally over much of the rubble work and the more decayed and open of the joints in the ashlar. Considerable areas of this material have become loose, and can be easily lifted from the stone, suggesting that there was a pointing exercise carried out at some point after the 1912 work. The one known instance can be dated to 1971 by the incorporation of a decimal penny bearing that date in an area of cement flaunching on the wall core above the springer of Bay 4/5, where the date of 19 April has also been incised into the wet cement.
- 3.3.2 In 1989 cleaning and repair work was undertaken by Wells Conservation Centre during its brief resurgence under Richard Stokoe. The previous season had seen the cleaning of the south-eastern crossing pier using sub-contracted labour and a Bristol-based commercial cleaning company. The capitals beneath the vaulting springers and elsewhere were cleaned, and mortar repairs were carried out to the decaying mouldings and ornament of the northern

window heads, using stainless steel armatures to build the repairs around. The whole was then sheltercoated.

- 3.3.3 By 2004 much of the mortar was decaying, exposing the steel armatures in places. Most of the (rather coarse) sheltercoat had been shed. The capitals remain clean, but appear to have been over-cleaned, possibly with the loss of some paint films, since there are slight residues of what may be colour in the deep mouldings of the abaci of Bays 4/5 and 6/7. An area of red ashlar-lining on white ground noted and photographed prior to cleaning in 1989 has not been found during the current inspection.

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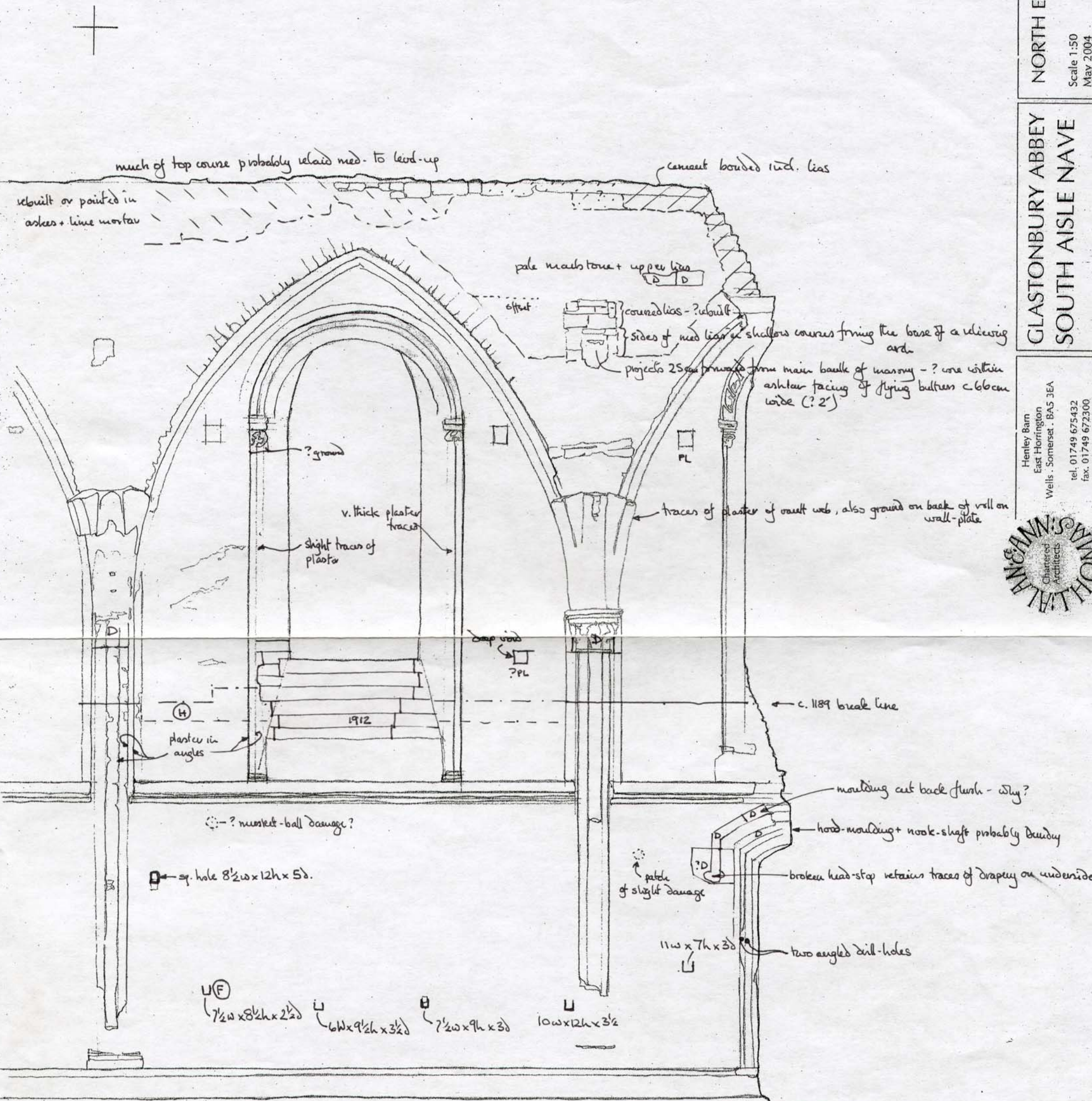
Willis 1866

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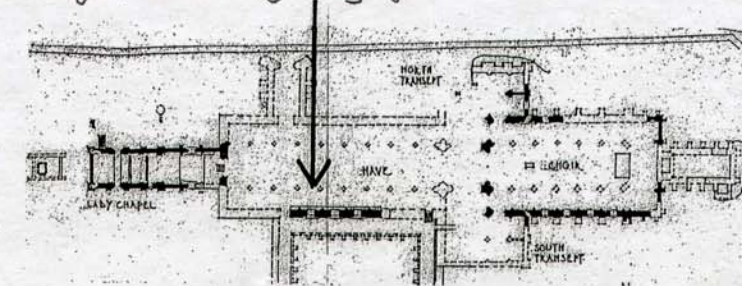
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(F) See sheet for area E of here. The two deflections in the level of the sockets is difficult to account for - they all lie with their base on a bed joint, but drop from 98 1/2 above bench to 76 cm above, and then rise in the W bay to 124 above. Their relative sizes suggest a greater raking angle for the lower slots suggesting that they are supports for timbers with their soffits at the same ~~relative~~ height.

(H) While the break-line in bays 4 + 5 and the remnant of Bay 7 is fairly clear (dropping from 120 cm to 1m above the top of the sill string-course) there is a possible (more subtle) indicator of a change in that there tends to be a band of decay which may occur above a hiatus point. This coincides with the stylistic change in Bay 4, but is more variable elsewhere, and here and in the W side of Bay 5 suggests a break at 80-75 cm - perhaps the over-winter break-line prior to the main break - the mortar having gone off hard enough to provide a relatively impervious horizon, concentrating decay agents in the course above.



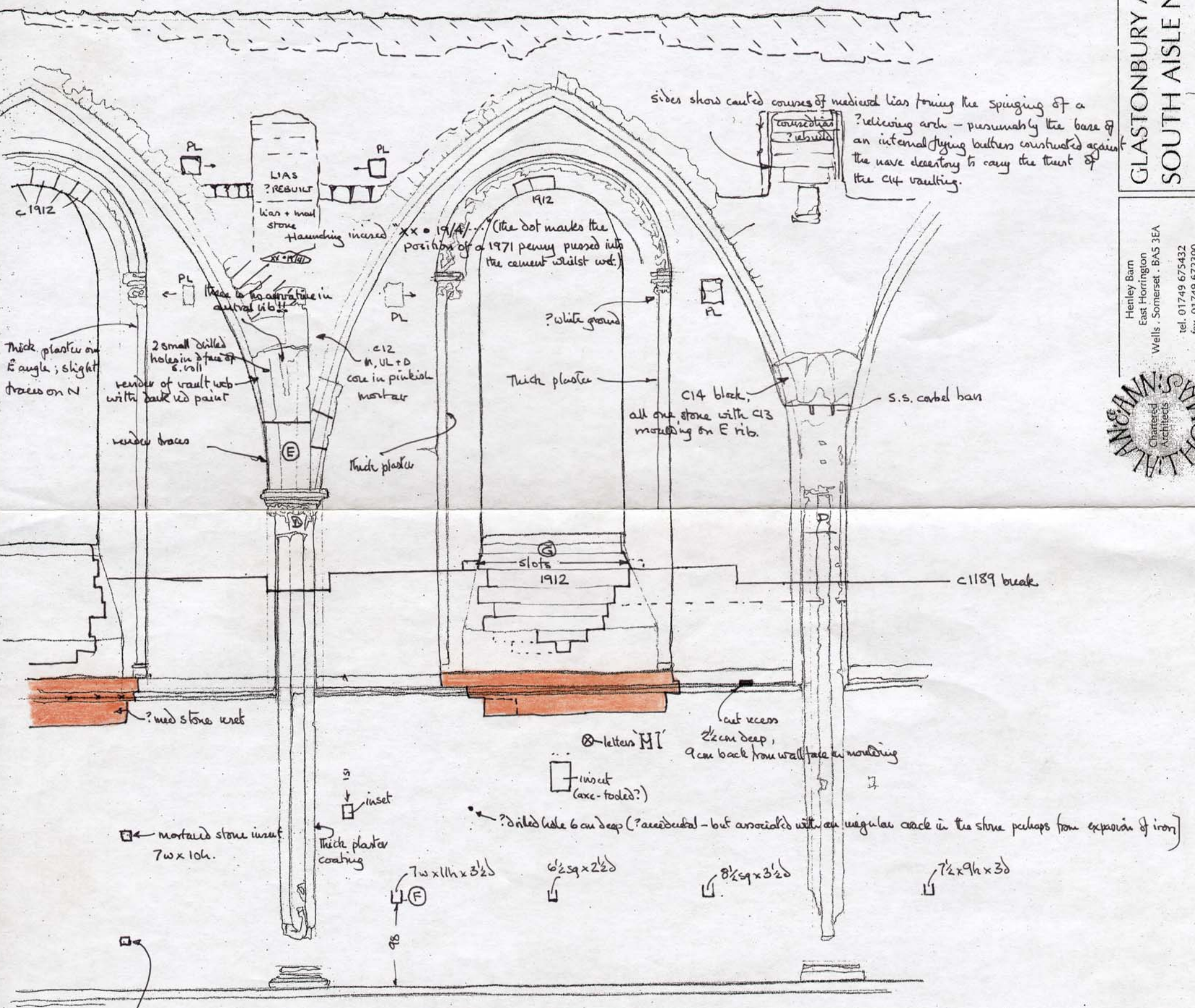


(E) The E diagonal and N transverse ribs are on the same springer, but the W diagonal rib is entirely separate throughout its remaining height. There is no discernible curvature of the N transverse rib. Unlike the topmost stone of the external rib may not be in situ the three lower stones ~~are~~ all comprise both diagonal and transverse ribs and must be as built - surely the arch could not have been stilted to this degree? Could it have been configured thus to accommodate the temporary wall closing off the E nave - but if so why cause the mouldings rather than just leave a vertical face?

NORTH ELEVATION (2 of 3)  
Scale 1:50  
May 2004

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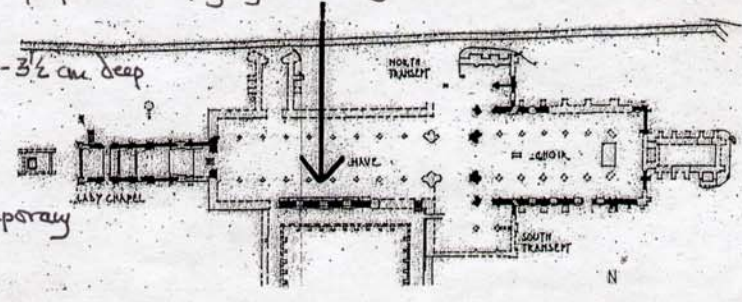
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(E) roughly worked square recess 7cm sq + 7cm deep, at its lower centre is the end of a circular (?drilled) hole lying on the topmost point of the perpendicular bed joint [caused 175cm E of E edge of wall-shaft].

(G) Two square holes in the weeds: E = 9 1/2w x 10h x 16d; W = 9w x 8 1/2h x at least 9cm deep; the eastern is open, the western is filled with mortar and a piece of turf (?∴ at same date as holes higher in these jambs?). Purpose?

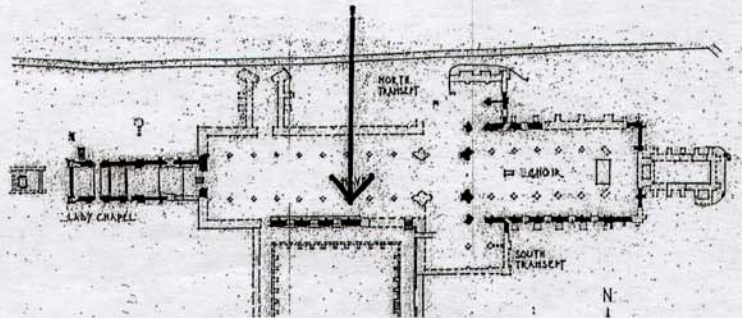
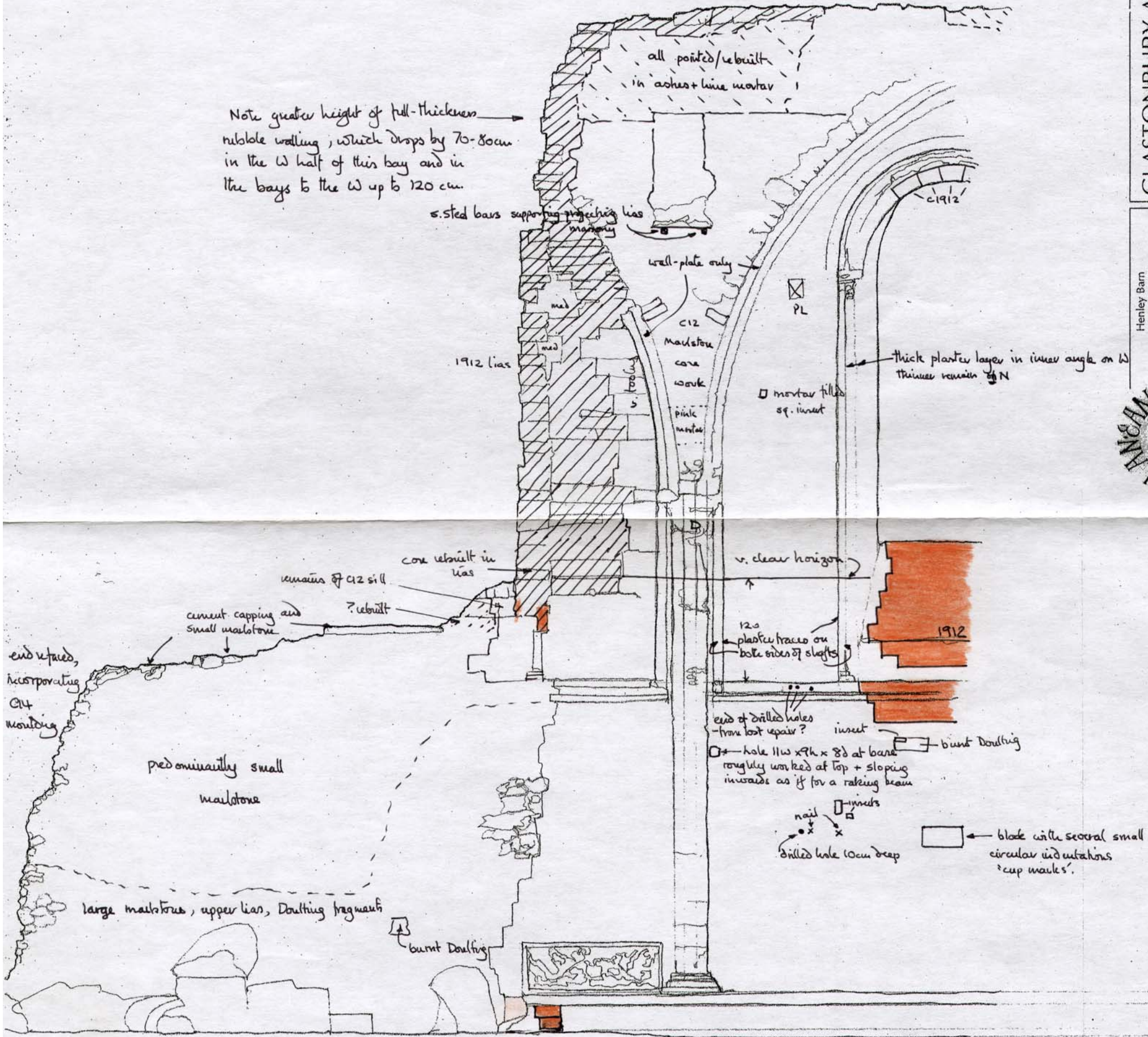
(F) Series of shallow squared recesses, all cut with their base on the same bed joint and one edge on a perpendicular - implying that they must have been made at a time when the masonry was exposed (and not plastered over). This would appear to indicate a date during the period of construction. Each recess is wedge-shaped, dying out at the top, all but one 3-3 1/2cm deep [(ii) is only 2 1/2cm]. The shape suggests the seating for the end of a raking beam, and their similarity to the holes associated with the first cloister on the S elevation suggests both similar date and similar purpose. As a working hypothesis there may be suggested as the seatings for a temporary (provisional) passageway to/from the cloister used while the nave was incomplete.



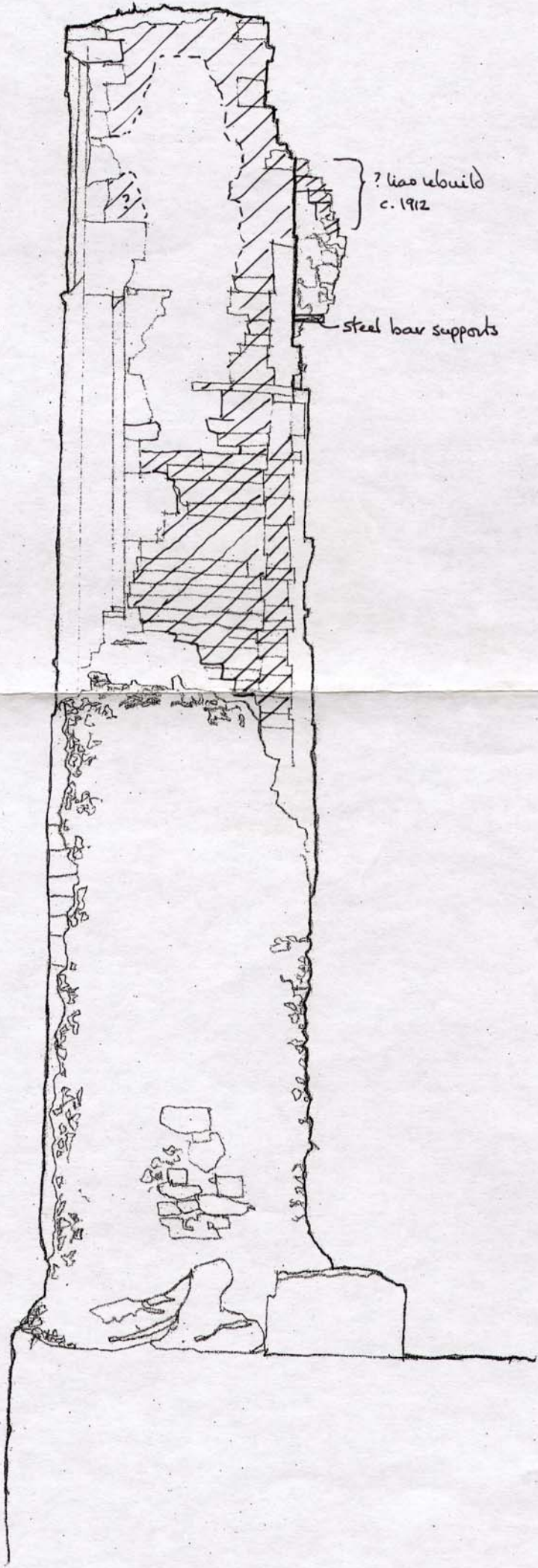




Note greater height of full-thickness rubble walling, which drops by 70-80cm in the W half of this bay and in the bays to the W up to 120 cm.



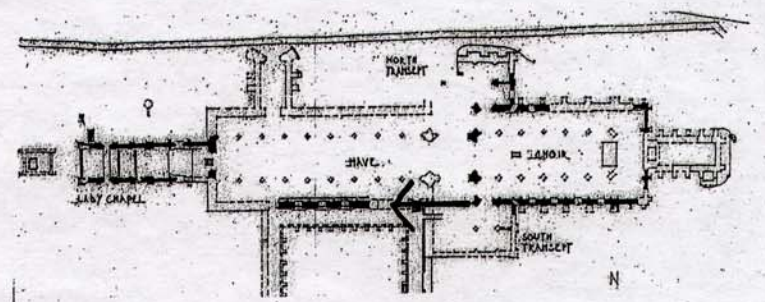




EAST ELEVATION  
 Scale 1:50  
 May 2004  
 262/53

GLASTONBURY ABBEY  
 SOUTH AISLE NAVE

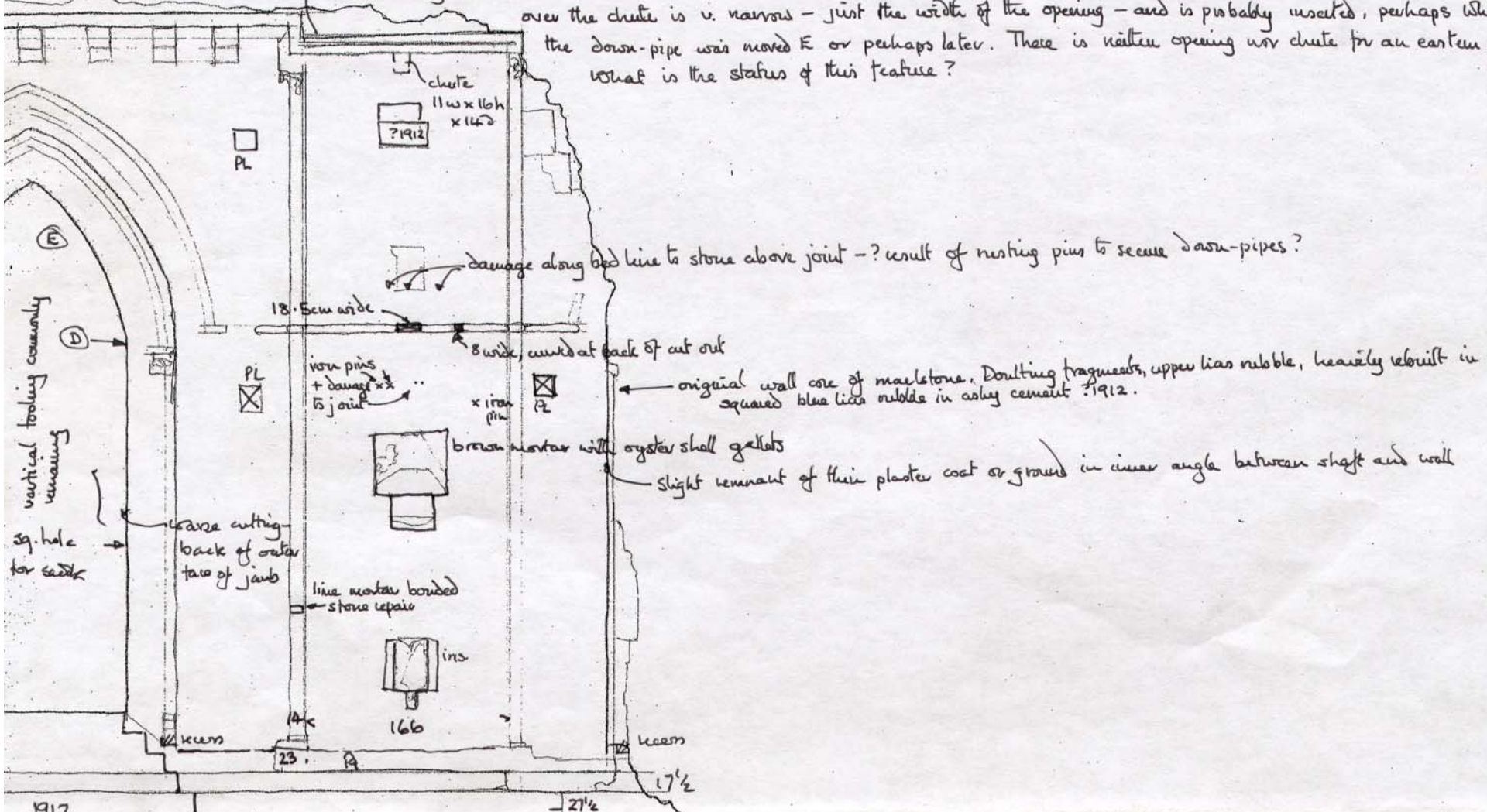
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- ④ Squared hole for saddle bar  $4\frac{1}{2}$  sq + ring .14 in deep. Poss. trace of a subsidiary hole just to the N, though v. uncertain; however, at the N end of the springing course for the S arch is a square mortar patch similar to those detected in ② & ③, and another sq patch with stone + mortar infill on the N arch's springing course base bed beside the angle with the N facing chamfer.
- ⑤ Much paint remaining slate with red overlaid with white with pink (or wash of red spread over limestone?) and black.

lower and quite different form of parapet, the capitals feiate adaptations of the corbels fr. the corbel table, but apparently genuine since the keel of the attached shaft beneath is carried up onto the neck. The water-chute on the central stone immediately beneath the string-course is correct for the down-pipe beneath, but it appears to be closed by the string. However, the stone over the chute is v. narrow - just the width of the opening - and is probably inserted, perhaps when the down-pipe was moved E or perhaps later. There is rather opening w/o chute for an eastern pipe. What is the status of this feature?

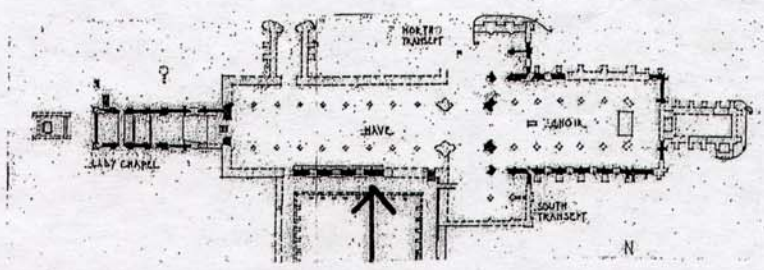


vertical tooling commonly remaining  
sq. hole for saddle

SOUTH ELEVATION (1 of 3)  
Scale 1:50  
May 2004

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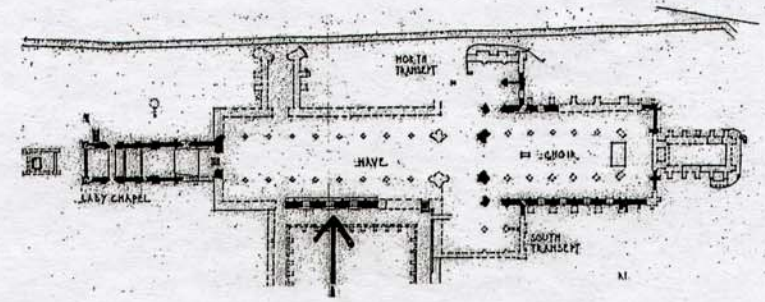
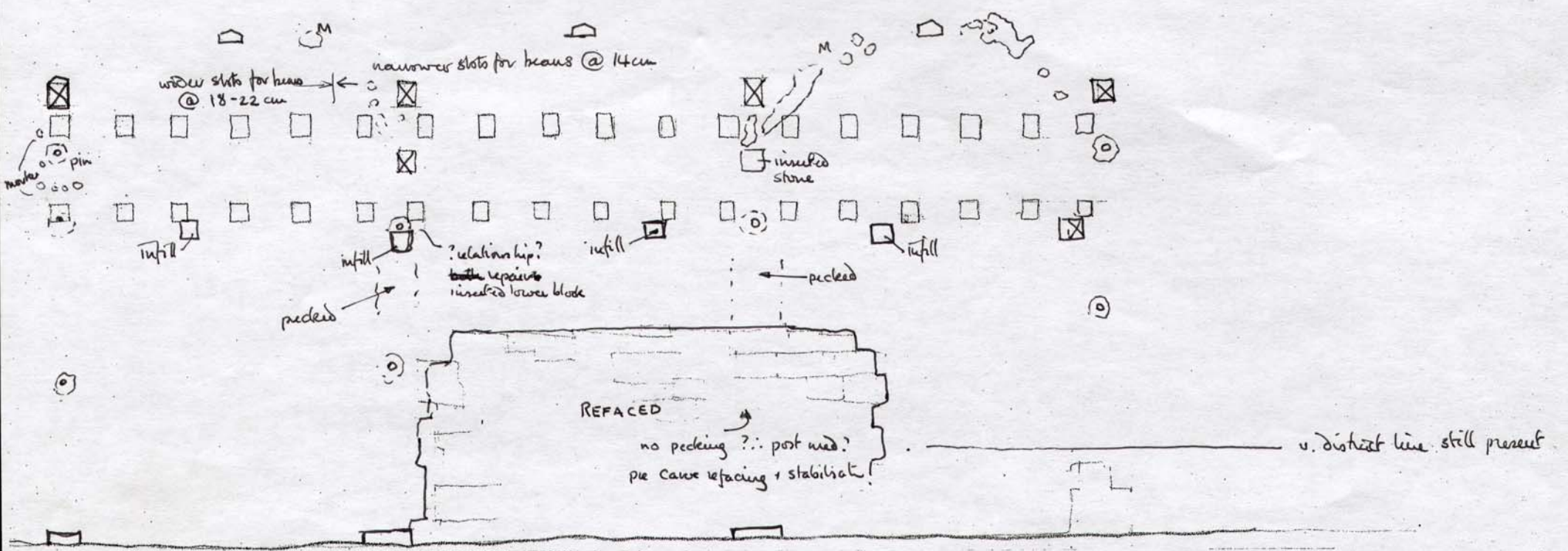
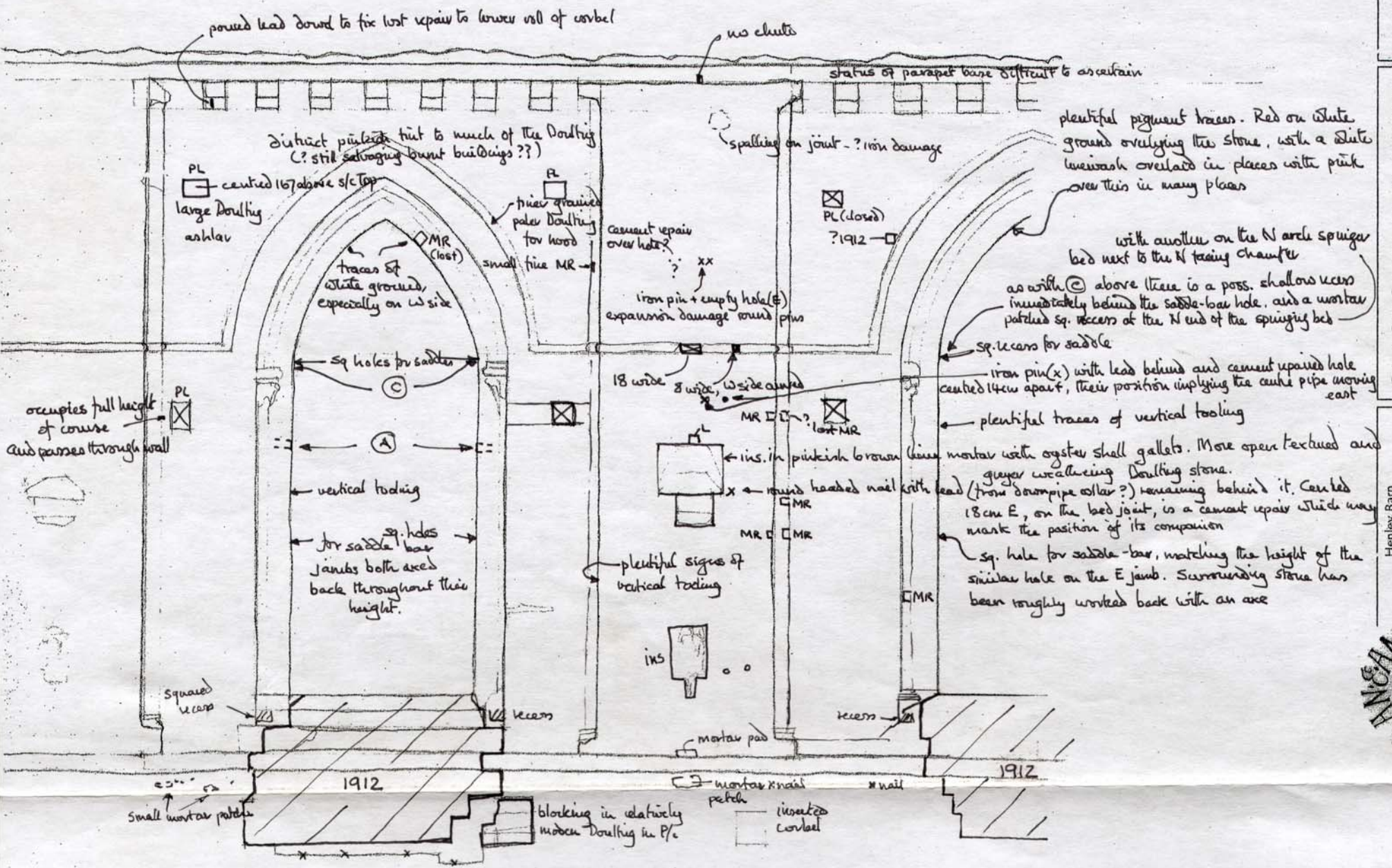


- (A) 3 sq. holes on each jamb between 11 + 15 cm and roughly square, up to 36 cm deep - 4 are filled with squared fragments of tufa (the 2 on the west fixed with a pale lime mortar, those on the W base; the other two with loose weathered fragments of Dorling stone mouldings. The use of tufa, and the mortaring-in of the E pair suggests a med. (or Dissolution?) date.
- (C) Centred 14cm back from the centres of the saddle-bar holes, and a little lower (being on the base bed of the arch springer) are two semi-circular recesses,  $5\frac{1}{2} \times 3h \times 4\frac{1}{2}d$  (orig) to W and  $6\frac{1}{2} \times 3\frac{1}{2}h \times 4\frac{3}{4}d$  (orig) to E. This course-line dies out as it approaches the N edge of the jamb and at this point on each side is a square mortar (E) or mortared stone (W) patch. @ the springing course of the N arch, at the angle with the inner chamfer, on each jamb is a further square mortar patch. Cf. (B) - to do with anchoring centring for the 2 arches?

SOUTH ELEVATION (2 of 3)  
Scale 1:50  
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(B) On the bed rising back from the top of the spacing abacus are 2 areas of mortar infilling on each jamb, centred 23 + 63cm back from the inner face of the saddle-bar hole (W - the E is 26 + 58 cm). Their infilling shows that they went out of use in the middle ages - the mortar is similar to the construction mix so they may belong to the centering for the arch. The same is suggested by the presence of pairs of square mortar-filled holes on the lines of the top of the N facing abaci on each jamb, the northern on the face of the jamb next to the chamfer, the southern centred 44 (E) and 58 (W) cm back from the angle. Each pair lies on the springing of its respective arch.

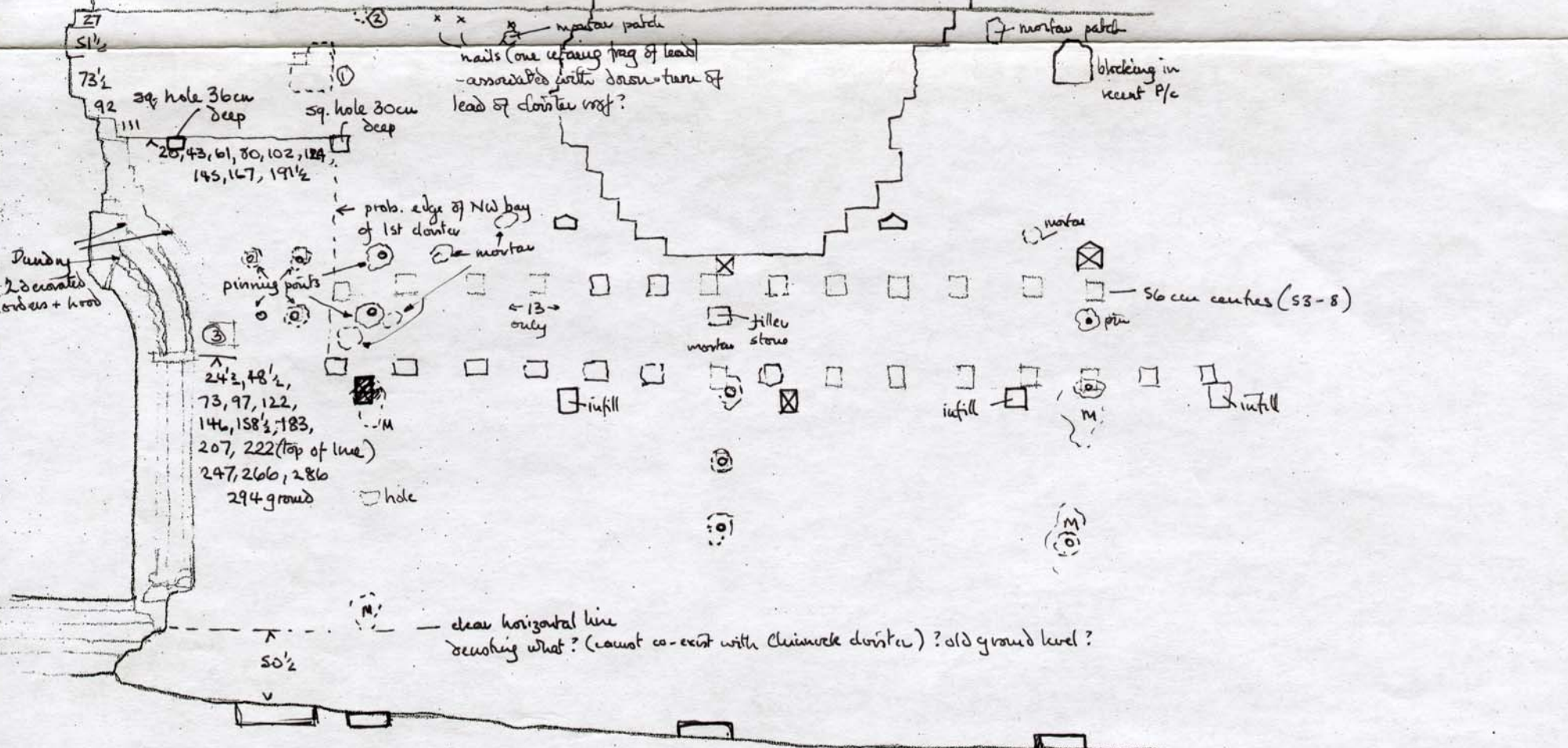
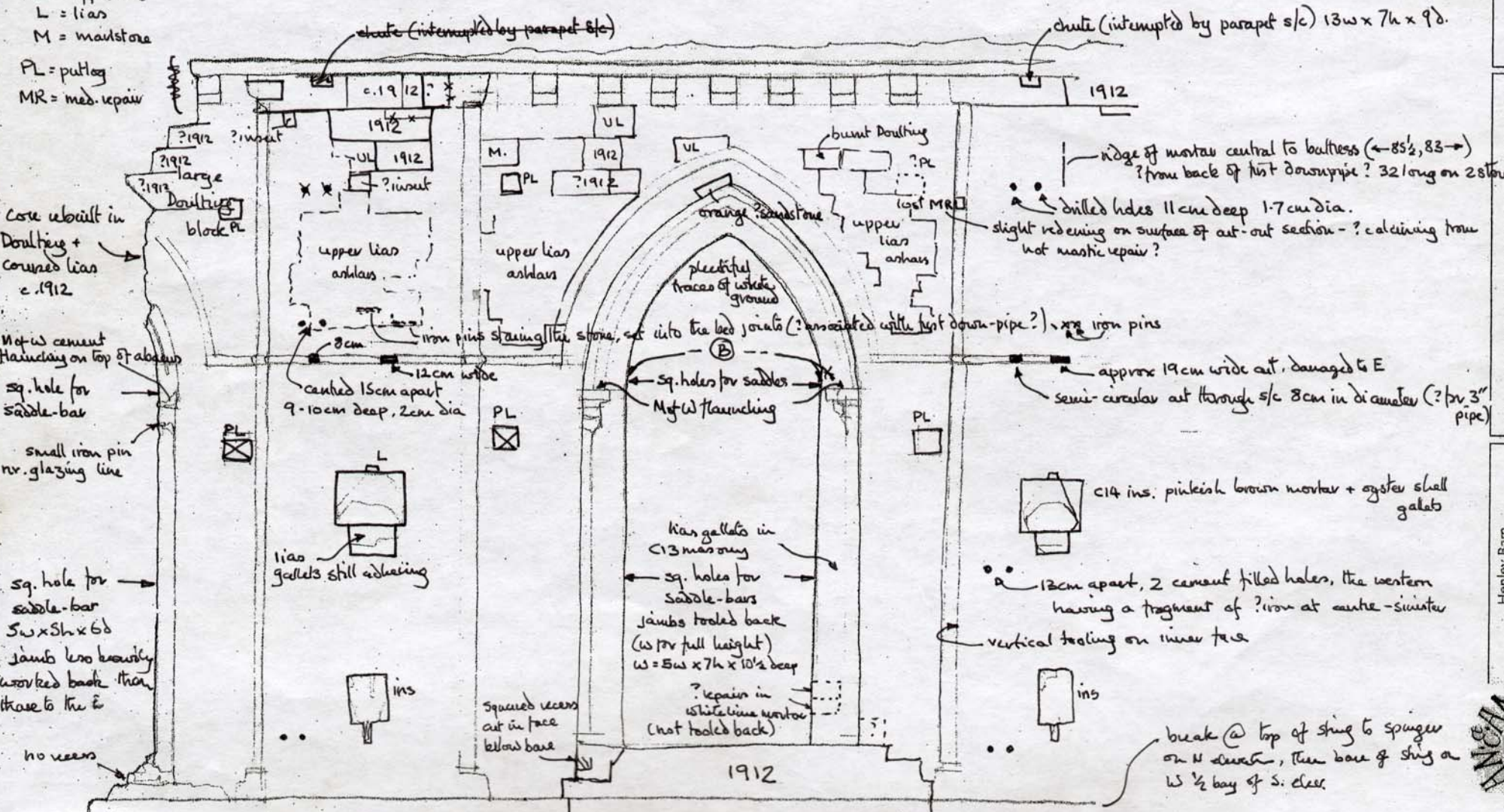
SOUTH ELEVATION (3 of 3)  
Scale 1:50  
May 2004

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SOUTH AISLE NAVE

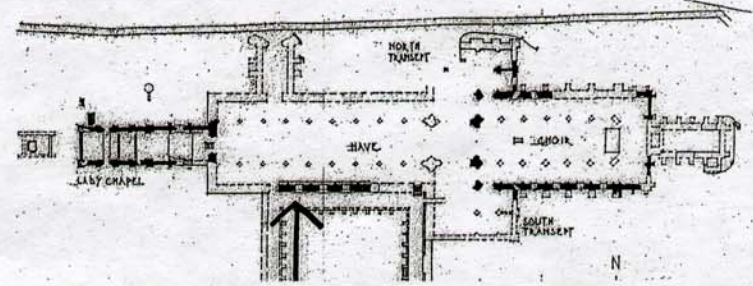
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UL = upper lias  
L = lias  
M = mainstone  
PL = putlog  
MR = med. repair



- ① blocking of hole left by withdrawal of corbel for wall plate
- ② mortar patches adhering to block below s/c (? associated area of carbon accumulation) - to do with roof?
- ③ blocking of destroyed label stop includes a piece of moulded ?Dundry with lime wash on the surface. Blocking initially fixed in a rich brown ?roman cement, with later P/c pointing





Lies forming the N edge of the rebuilt face, with (large) pieces of marble and some upper lies (generally in the top course) All with cement haunching.

WEST ELEVATION  
Scale 1:50  
May 2004  
262/57

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?Delta metal cramp c.1912  
2.7cm wide x 1.2cm thick

ashlar facing probably fixed medieval stone - though possibly from elsewhere, since there are signs of diagonal tooling and a generally crisper finish. The corbel is a med piece with the central keel moulding (unlike those in the bay to the E, which have a flat between the nls).

terminating hole 5w x 5.2h x 5d

socket running diagonally into the angle, ?orig. cut through the wall-shaft  
4cm+ wide, orig. up to 14cm deep

recess for ?iron fixing bar 3 1/2 cm square, set diagonally into the wall running in to 23cm deep. This lies at the upper sinister corner of a rectangular recess, also showing signs of having been roughly cut back, presumably to extract a metal plate of some kind.

pair of similar shallow rectangular recesses set just below the springing of the arch, that to N 5w x 4h x 8d and partly filled by mortar (?squeezed from an adjacent joint?) to S (at centre of the jamb) 5w x 3h x 3.7d. Their position suggests they may have been associated with supports for the casing of the door arch during construction (cf the sq. inserts on the window jambs at springing level).

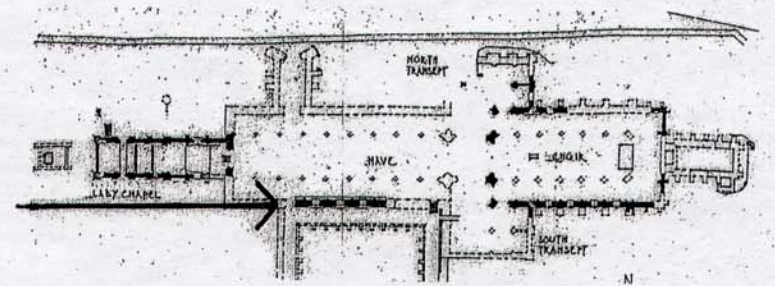
Dundee for decorative mouldings

scars of holes for door-hinge pivots, brutally cut out presumably at the Dissolution to extract the iron

small square recess 4.5w x 6.5h x 4 deep. Purpose?

seating for drain bar

Groove cut 1.8cm into the ashlar face of the jamb, generally 4cm wide and with an estimated overall length from the base to the upper point of the socket for its wall-fixing of 131cm. At the base of the cut is another horizontal groove, up to 6cm deep at the centre, and running out at either end. This lies 14cm southwards and more than 20cm northwards (beyond which the stone is broken). This base groove shows a very slight curvature suggestive of a hooked bar swinging against the wall and cutting a groove by abrasion. The top of the vertical groove aligns well with the scar of the diamond-wise wall-fixing, but it is 4cm out of vertical (running northwards as it descends) - presumably as a response to the additional weight of the L-shaped hook on the end of the bar.





**Appendix 1 - Schedule of paint traces**

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1. Doorway to NW bay of cloister: roll moulding in internal angle of NE jamb. In the internal angle between this nook-shaft and the door jamb, on both sides, there are considerable remains of a thick plaster over the whole height of the remaining extent of the shaft. In most places this survives as a rough (?broken) face, but at the apex, for 16 cm. below the angle at the head of the doorway it appears much smoother, and in the top 9 cm may be a finished (albeit decayed) surface. This bears a few dark patches which appear (under magnification) to be dirt; but also a smooth pinkish surface which could be a survival of limewash or residual pigment.

Above this, in the angle of the roll to the west, and on the underside of the top run of the roll across the door-head, is a black deposit forming a discrete skin: this is probably no more than carbon pollution, but it could overlie traces of a paint film.

2. Doorway to NW bay of cloister: on the springer block of the inner moulding of the eastern jamb of the door-head there are several areas of red-brown colouration which appear under magnification to be no more than iron-rich surface of the lightly weathered stone. However, one small patch approximately 5 mm across stands proud of this surface and appears to bear red ochre pigment.

3. Doorway to NW bay of cloister: on the remaining 'roof' stones of the doorway (of which two courses and one stone of a third survive) there are two major and several minor patches of surface finishes which interleave in a confusing manner. There are several amorphous (and one coherent) patches of fine mortar or plaster of pinkish-buff colour, the best patch with a fine smooth finish and a thickness of approximately 4-5 mm. There are also a number of patches of limewash in up to 6 layers, which in places overlie and in other places are overlain by the pinkish-buff plaster.

The implication appears to be that an earlier plaster layer was partly cleaned off and replaced by white limewash, which was maintained over a period probably approaching 60-100 years, and then itself replaced by a second plaster application.

4. Doorway to NW bay of cloister: Dundry stone chevron ornament on the south-eastern jamb. Given the extent of the painted decoration surviving on the Dundry stone of the Lady Chapel, this area might be expected to retain more paint than it appears to. There are a number of small patches of ground (or, given the presence of fine aggregate in the white matrix in places, of a later fine plaster coating), but there appears to be little or no surviving pigment associated with this. Both inner and outer moulded orders retain ground and/or plaster in the deep angles. On the inner order in particular the protected surfaces of the chevrons remain black, and it is possible that further ground/pigment traces survive here.
  
5. North (interior) elevation: wall-shafts of Bay 6/7 division. Like virtually all the internal wall and nook shafts, this has extensive traces of white plaster remaining in the internal angles; the thickness of the original coating being difficult to judge, since the angle will naturally retain more of the material. Here, this would appear to represent a relatively late surface finish, since three blocks below the base of the sill-level string-course it appears to fill a hollow in the stone caused by decay or accidental damage.  

There is much less evidence for plaster in the mouldings of the triple shaft itself - indeed what remains here appears rather to be mortar squeezes or runs from the joints, rather than the fine white plaster found in the angles with the wall. Was the plaster a coating associated with the decoration of the plain ashlar wall-faces, and the wall-shafts treated in a different way?
  
6. General entry: plaster remaining in the angle between the wall and roll-moulding.
  
7. Bay 4/5 - capital beneath vault springer: the eastern end of the hollow moulding within the abacus, within and beside the curl of the miniature stiff-leaf which terminates and bridges its dexter side, shows a smooth surface with a distinctly pink/red colouration, probably a pigment residue. This capital (and the others) must have been cleaned during the 1989 conservation programme - was pigment reported by the conservators? It appears to have been sheltercoated over.
  
8. Bay 4/5 - wall shaft two blocks below capital: the east face of the central shaft has smooth, thin white patches, evidently ground of limewash with a pinkish surface in places, possibly paint residue, but equally likely to be a natural colourant.

This seems to confirm that the thick plaster finish did not extend onto the shafts themselves, and that these were probably simply limewashed and painted.

On the west face of this shaft there are areas of carbon deposition still remaining, in the vicinity of which are occasional very small flecks of green - these are probably of vegetable origin rather than paint traces.

9. Bay 4/5 - capital below vault-springer: on the 'crossover' volute which united the central and sinister bell, on the 'neck' to sinister of the junction is a patch of raised smooth white surface 2 cm long and 8 mm high, evidently remains of white ground. There are several other likely traces of ground, particularly in the deep recesses of the junctions between the upper and lower tiers of volutes.

10. Bay 6/7 - capital beneath vault springer: most of the dexter bell, from 10 cm above the top moulding of the neck-ring appears to be a medieval repair, comprising a piece 10 cm wide x 23 cm high x 21.5 cm deep; at its lower margin, on the parent block, there is a distinct pink colour along the joint. This, however, lies on an abraded surface and is therefore clearly not a pigment residue, but rather the result of the heating of the stone to make a bond using hot mastic of the type found elsewhere from the early years of the thirteenth century (as at Wells,<sup>29</sup> Salisbury etc.<sup>30</sup>). This confirmation of the use of hot mastic on a capital of the same stylistic type (having a leaf on the abacus) as that in Bay 4/5 suggests a date in the early thirteenth century rather than the later twelfth century for the recommencement of work following the post Phase 1 hiatus.

There are areas of smooth, slightly pinkish surface, which could represent original prepared surface with pigment residue on the abacus at extreme dexter adjacent to the miniature stiff-leaf which bridges the hollow moulding, and on the central bell at centre-dexter above the first pair of bifurcating volute stems of the lower tier of foliage.

To dexter of the capital, on the western face of the keeled roll-moulding, just below the top of the bell and just below the level of the neck ring, are substantial areas of white ?ground, again retaining a slightly pink surface in places.

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<sup>29</sup> Sampson 1998, pp.103-8.

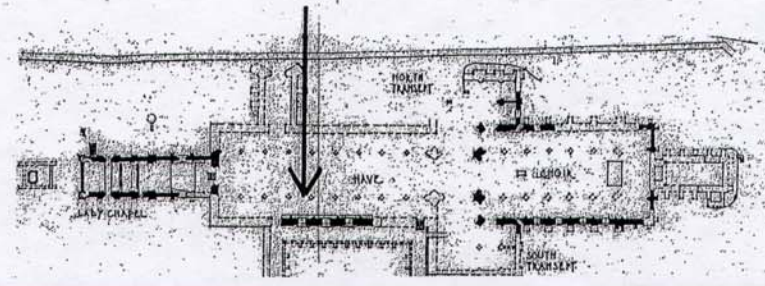
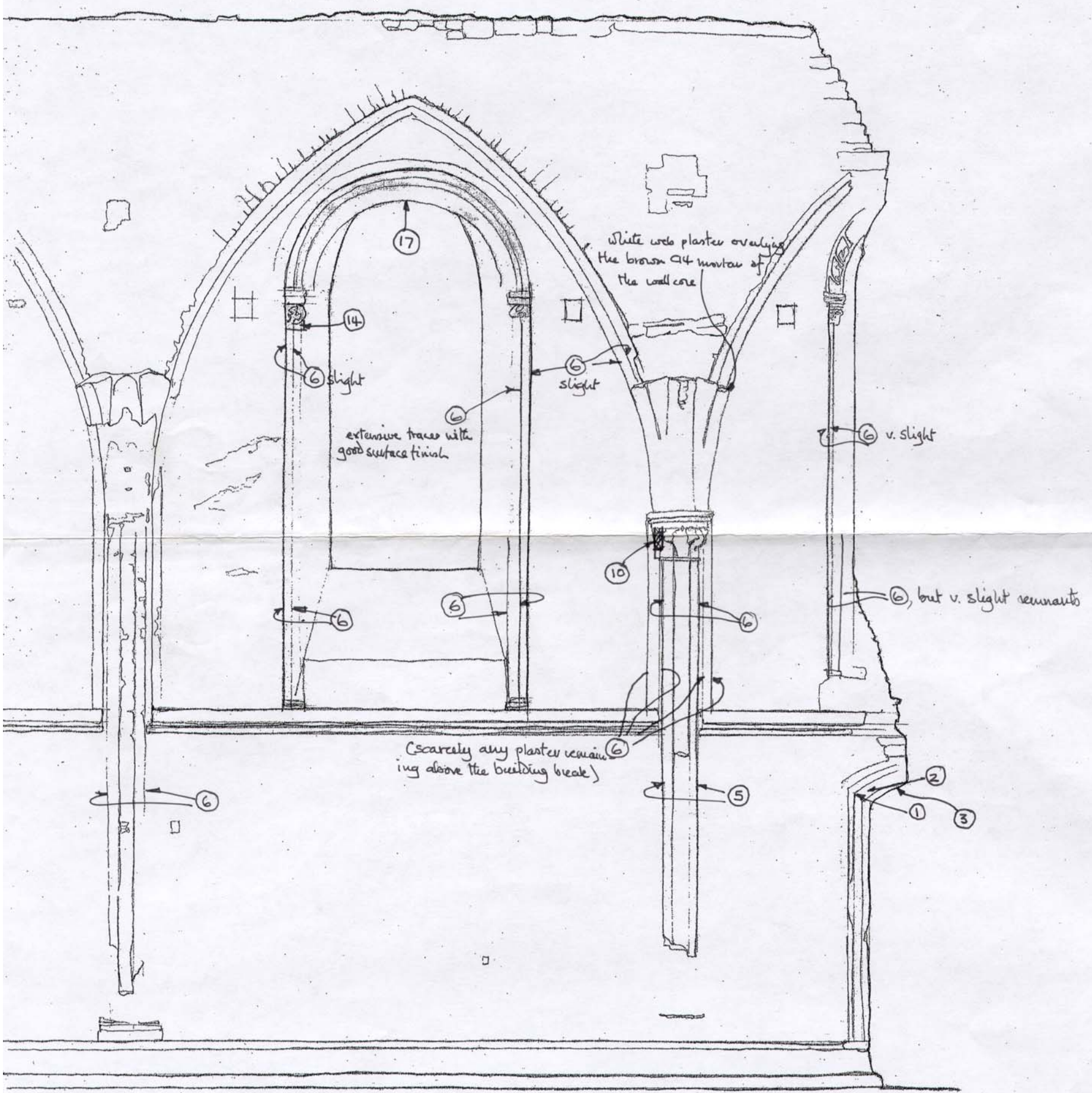
<sup>30</sup> Ayers (ed.) 2000, pp.28 and 32-3.

11. Bay 4/5 - vault springer. On the dexter (eastern) side of the vault rib, for 75 cm above the top of the abacus there is a spread of mortar/plaster with a smooth surface finish which probably represents a survival of the finish of the vault web extending onto the rib. Above this, on the north elevation, to a height of 157 cm above the top of the abacus is a similar mortar spread overlying the rubble work of the wall core/web. The mortar here has a generally rougher surface than that at the base of the rib, but it retains three patches of red ochre pigment: two to dexter perhaps originally forming a single narrow red line running parallel with the line of the adjacent wall rib 13 cm (5") back from the step with the western edge of the roll-moulding of the rib - this being a line now only 2 mm wide, and representing a discontinuous line 7 cm long; the other patch being wider (up to 1.5 cm) but more diffuse, set only 6mm back to the east of the edge of the stone bearing the vault rib. These survivals probably represent fragments of the ashlar-lining of the wen, similar to that found extensively elsewhere in late twelfth century and early thirteenth century contexts (as at Wells, Salisbury etc.).
  
12. Bay 4/5 - south-western diagonal vault rib. This bears two complete and two fragmentary drilled holes on the inner (eastern) face of the western angle roll. The lower three holes are relatively evenly spaced, 12 and 10 cm apart at their centres, but the second on the fragmentary holes is only 5 cm further up the moulding. These could conceivably have housed stars or other decorative motifs, like those suggested for the spandrels of the Lady Chapel or the ribs of St Joseph's Chapel, two of which have been retrieved from excavation at the Abbey. The holes are 2-3 cm deep with a rounded base to the cut, and are 1.1 cm in diameter. This vault rib has the greatest projection of any of the remaining examples, and may therefore be the only one which might have retained such fixings.
  
13. Bay 4/5 - south-western diagonal vault rib. There is a white deposit in the angles between the rolls and central keel. This could a survival of ground, but it has a rather odd texture, and may overlie rough surface - is this natural oxalate deposition associated with lichens?
  
14. Bay 6 - dexter window capital. Mortar/plaster (??ground) skim at lower sinister corner of block.
  
15. Bay 4 - soffit of window head. The most significant area of surviving medieval paintwork on this part of the Abbey ruin is a scatter of patches of ground, pigment and limewash extending over virtually the whole of the arch from one course above its springing on both sides. Here there are patches of thin white



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SOUTH AISLE NAVE

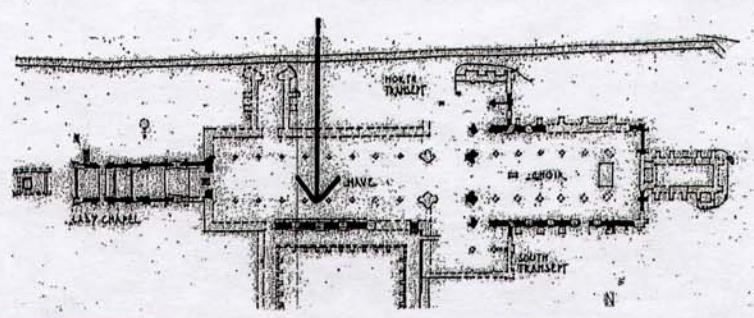
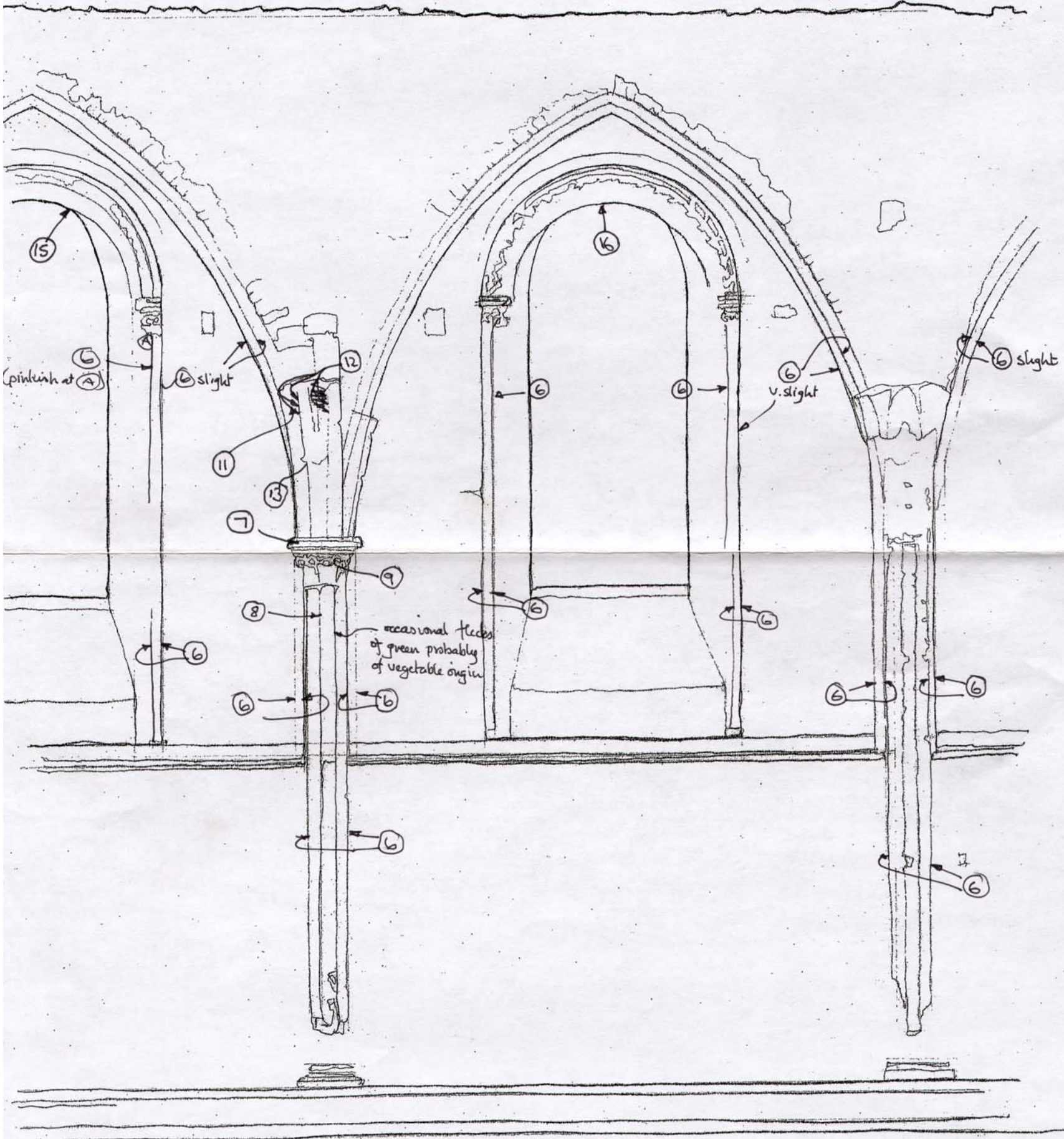
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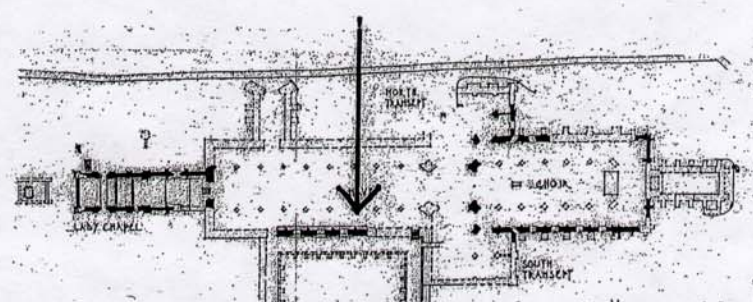
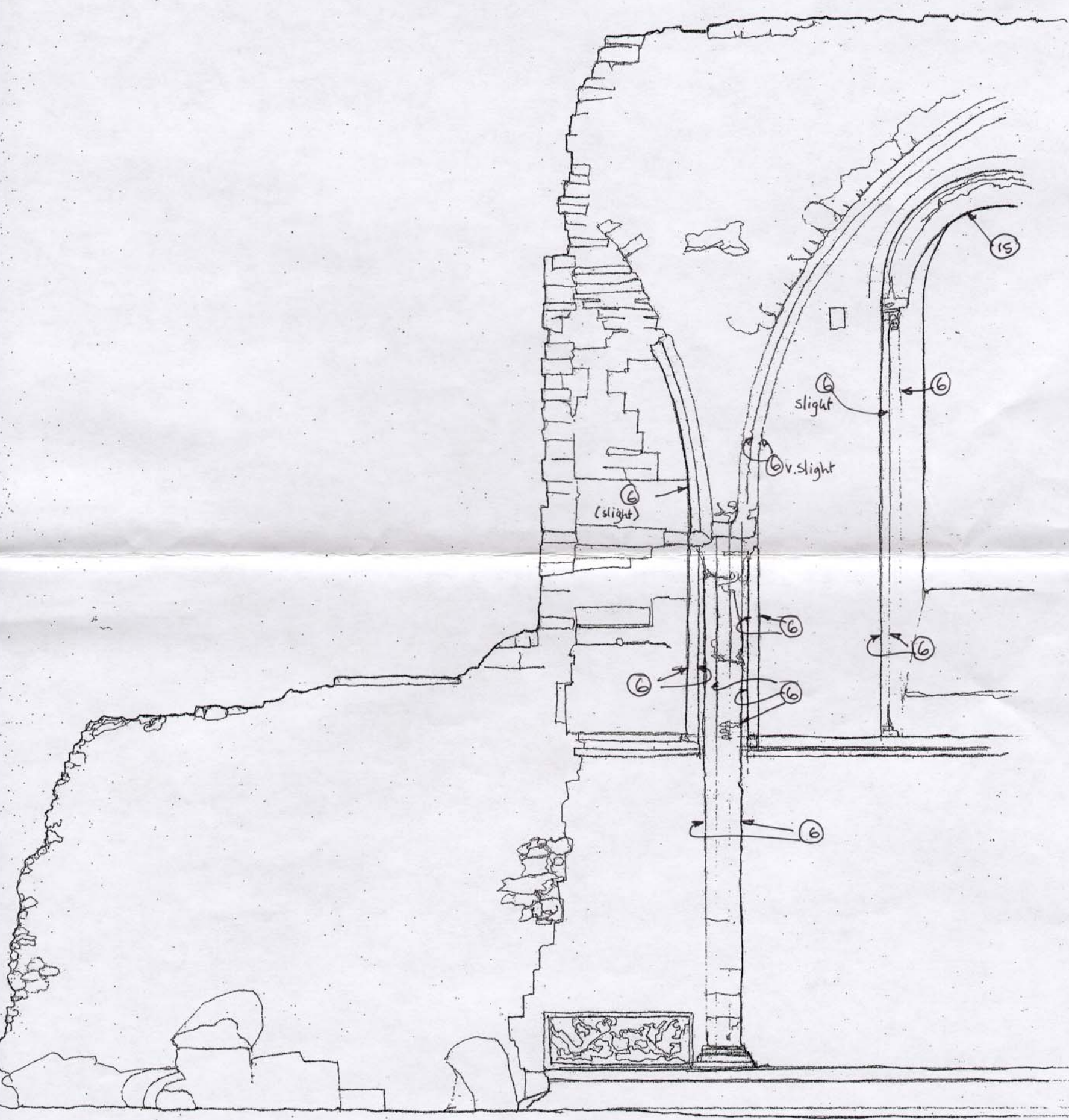
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NORTH ELEVATION (3 of 3)  
Scale 1:50  
May 2004

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N

ground supporting a dark red ochre pigment, pinkish residues, perhaps caused by the wiping down of partly water-soluble red ochre paint, and a small area of black paint. Not enough survives to make out any detail of the original scheme, although in the north eastern sector, on the second course above the springer-course, 15cm south of the inner arch face is an area of red ochre with a clear northern margin which does not appear to be a straight vertical line - suggesting foliate patterning rather than simple geometrical ashlar lining. The line would also have been upwards of 1 cm wide, which would be unusual for ashlar lining.

In a similar position (but one course higher) on the west side of the soffit of the arch is another, more diffuse red line which appears to be a curve running almost horizontally but turning steadily upwards as it moves north.

There is clear evidence for at least one layer of limewash overlying the red ochre painted ground, this wash also bearing a slightly pink colouration. This is flaking in places.

Near the apex of the arch, on the western side, and towards the southern edge, there is a thicker white limewash (which may be the same as that bearing pink colouration elsewhere) which tends to have a discoloured brown surface, possibly of natural origin.

16. Bay 5 - soffit of window head: residual traces of white ground/limewash on the five upper courses to the west of the arch head, and the three upper courses to the east.
17. Bay 6 - soffit of window head: residual traces of white ground/limewash generally over much of the soffit, including areas on the east which appear abraded (suggesting a later medieval date?).

No.	Site	Description	Film title: Glastonbury Abbey South Nave Aisle 2004/1/ 8 to 37
1/ 23	<b>Glastonbury Abbey</b>	S elevation, lowest (ground) lift: detail of W bay wall shaft [E of heavy W respond], mortar traces around springing	50mm macro lens
24	South Nave Aisle	ditto, next bay east, detail of wall-shaft area, showing pins and pecking of surface	
30		S elevation, second lift: blocking of hole left by withdrawal of western corbel to support C14 wall-plate	
31		S elevation, Buttress between Bays 6/7: cement filled holes for securing lead rainwater pipe above cloister roof	
32		S elevation: modern blocking of hole left by withdrawal of corbel to support C14 wall-plate [E of frame 30]	
33		S elevation, Buttress between Bays 5/6: cement filled holes for securing lead rainwater pipe above cloister roof	
34		S elevation, angle beneath sill-level drip course: round headed nail with fragment of lead trapped behind it - from cloister roof	
35		S elevation, modern blocking hold left by withdrawal of corbel to support C14 wall-plate [E of frame32]	
36		S elevation, Buttress between Bays 4/5: open holes for fixings to secure lead rainwater pipe above cloister roof	
37		S elevation, western surviving corbel to support C14 wall plate	

Film: Kodak Royal Supra 200-135-36

Date: 23 November 2004

Camera: Olympus OM4 with 28mm f.3.5, 35mm shift f.2.8, 50mm macro f.3.5 Zuiko lenses and Olympus T32 flashgun

No.	Site	Description	Film title: Glastonbury Abbey South Nave Aisle 2004/2/0 to 36
2 /0	<b>Glastonbury Abbey</b>	S elevation, Buttress between Bays 4/5: mortar pad, central on top of cloister roof drip course under flying buttress	50mm lens
3	South Nave Aisle	S elevation, lower flying buttress springer between Bays 3 and 4	
4		S elevation, eastern surviving corbel to support C 14 wall plate, frontal and above	
6		S elevation, west bay of cloister: pins for securing springer of C14 N cloister walk at W margin beside NW doorway	35mm shift lens
7		S elevation, upper row of joist holes, looking NE from western end	
14		S elevation, 5th bay from W, landscape view of area around vault springer to show extensive mortar traces	
18		S elevation, 2nd bay from west, filler set into recess for ridge rib at apex	50mm macro lens
23		S elevation, east bay, mortar pads from vaulting wall-plate, looking NE	
24		ditto, next bay west, looking NE	28mm lens
25		ditto, east bay, looking NE	
26		S elevation, window of Bay ?, western jamb around ferramenta hole, showing rough tooling (?to remove glazing)	50mm lens
27		ditto, window of Bay ?	



29	ditto, general view of W jamb, showing rough tooling
30	ditto, Bay 5, E jamb showing rough tooling near glazing line and 3 square holes
32	N elevation, vaulting springer of Bay 4/5 looking SE to show vertical rise of transverse rib
33	Window of Bay ?, west jamb - oblique lighting showing vertical tooling of upper masonry
34	ditto, second example

Film: Kodak Royal Supra 200-135-36

Date: 26 November 2004

Camera: Olympus OM4 with 28mm f.3.5, 35mm shift f.2.8, 50mm macro f.3.5 Zuiko lenses and Olympus T32 flashgun

No.	Site	Description	Film title: Glastonbury Abbey South Nave Aisle 2004/3/6 to 29
3	<b>7 Glastonbury Abbey</b>	S Nave aisle, south elevation, Bay ?, mortar channels on soffit of upper flying buttress springer	
10		NE crossing pier, looking ENE from S nave aisle scaffolding	50mm macro lens
11		SE crossing pier looking E from S nave aisle scaffolding	
12		ditto	35mm shift lens
13		Crossing piers from S nave aisle scaffolding [landscape]	28mm lens
16		NE crossing pier, looking ENE from S nave aisle scaffolding	35mm shift lens
17	<b>South Nave Aisle</b>	N elevation, springer between Bay 4 and 5, east side, red paint traces	50mm macro lens
18		ditto, close up of traces against wall rib	
19		ditto, close up of traces against eastern diagonal rib	
21		N elevation, springer between Bay 6 and 7, looking ESE	
23		ditto, springer between Bay 6 and 7, looking SW	35mm shift lens
25		ditto	
28	<b>Transept</b>	N transept, E wall adjacent to choir to show traces of fixings for medieval rainwater down-pipe	
29		S transept, E wall adjacent to choir to show traces of fixings for medieval rainwater down-pipe	

Film: Kodak Elite Professional UC200-135-36

Date: 26 November 2004

Camera: Olympus OM4 with 28mm f.3.5, 35mm shift f.2.8, 50mm macro f.3.5 Zuiko lenses and Olympus T32 flashgun

No.	Site	Description	Film title: Glastonbury Abbey South Nave Aisle 2004/4/12 to 37
4 /12	<b>Glastonbury Abbey</b>	S Nave Aisle: N elevation Bay 4, E side - decayed course immediately above Phase 1 fabric	50mm macro lens
14	South Nave Aisle	? - pinkish plaster surface in angle between shaft and wall	
15		ditto: Bay 4, soffit of window head, Western side, showing traces of painted decoration	
16		ditto: Bay 4, soffit of window head, Eastern side, showing traces of painted decoration	
18		ditto: Bay 4, soffit of window head, traces of painted decoration, E side, detail with red and black pigment	
19		ditto: detail of southern side of previous view [note black at base]	
20		ditto: detail of northern side of previous view	
21		ditto: detail of upper part of previous view	
23		ditto: Bay 4, soffit of window head, E side, detail of ?curving red line	
25		ditto: Bay 4, soffit of window head, W side, detail of red overlaid by later limewash	
26		ditto: Bay 4, soffit of window head, W side, detail of curving red line [?foliage decoration?]	
27		ditto: 'T' mason's mark	
29		ditto: Bay 4, soffit of window head, W side, near southern edge - limewash with brown ?pigment	
30		ditto: close up of previous view	
31		ditto: Bay 4, soffit of window head: general view	28mm lens
34		ditto: Bay 5, soffit of window head: traces of limewash/ground	50mm macro lens
35		ditto: Bay 6, soffit of window head: traces of limewash/ground	
36		ditto: Bay 6, E window jamb - masons' marks	
37		ditto: Bay 6, E window jamb - mason's mark [reversed N]	

Film: Kodak Elite Professional 400UC-135-36

Date: 1-6 December 2004

Camera: Olympus OM4 with 28mm f.3.5, 35mm shift f.2.8, 50mm macro f.3.5 Zuiko lenses and Olympus T32 flashgun

No.	Site	Description	Film title: Glastonbury Abbey South Nave Aisle 2004/5/1 to 36
5 / 0	<b>Glastonbury Abbey</b>	S Nave Aisle, south elevation: Bay 5/6 - cuts through the buttress string-course for rainwater pipes	50mm macro lens
2	South Nave Aisle	ditto, Bay 6/7 - holes for fixing secondary down-pipe just above cut string-course [incl. Upper lias ashlar]	
3		ditto, Bay 6 - open putlog hole at window springer level	
4		ditto, Bay 5/6 - cut through buttress string-course for primary down-pipe, with iron pins in bed above	

5	ditto, Bay 5 - recess for lost medieval repair in eastern inner moulding of window head	
8	ditto, Bay 4 - detail of pink paint on eastern soffit of window arch	
9	ditto, Bay 4 - detail of black paint on eastern soffit of window arch	
11	ditto, Bay 4/5 - round-headed iron pin with lead trapped behind - from strap retaining primary down-pipe	
12	ditto, Bay 5 - eastern window head springer, showing holes (open and blocked) ?associated with centring	
14	ditto, Bay 7 - high capital at eastern margin of bay	
15	ditto, Bay 6 - high capital at western margin of bay	
16	ditto, Bay 6 - burnt Doultling ashlar in eastern spandrel above aisle window [incl. Upper lias ashlar]	
17	ditto, Bay 6 - high capital at eastern margin of bay	
18	ditto, Bay 5/6 - chute (interrupted by parapet stone) for down-pipe at apex of buttress	
19	ditto, Bay 5 - high capital at western margin of bay	
21	ditto, Bay 5 - high capital at eastern margin of bay	
22	ditto, Bay 4 - high capital at western margin of bay	
23	ditto, Bay 4 - high capital of unusual design at eastern margin of bay, frontal/dexter	
24	ditto, dexter	
25	ditto, Bay 3/4 - chute at top centre of buttress	
26	ditto, Bay 3 - high capital of unusual design at western margin of bay	
27	ditto, Bay 6 - eastern spandrel above window, looking down, showing upper lias ashlar work	28mm lens
29	ditto, Bay 6 - medieval repair in eastern nook-shaft, showing slight reddening of surface	50mm macro lens
33	ditto, Bay 5 - western corbel, showing poured lead dowel, dexter to include pouring hole	

Film: Kodak Elite Professional 200-135-36

Date: 6 December 2004

Camera: Olympus OM4 with 28mm f.3.5, 35mm shift f.2.8, 50mm macro f.3.5 Zuiko lenses and Olympus T32 flashgun

No.	Site	Description	Film title: Glastonbury Abbey South Nave Aisle/6/0 to 14 and 27 to 34
6 / 1	<b>Glastonbury Abbey</b>	Polychromy catalogue No.2 - cloister doorway, red speck	50mm macro lens + T32 flashgun [f.22]
2	<b>South nave aisle</b>	Polychromy catalogue No.1 - cloister doorway, internal angle at top	
6		Polychromy catalogue No.3 - cloister doorway 'roof', limewash layers	
8		Polychromy catalogue No.3 - coherent plaster patch	

9	Polychromy catalogue No.3 - ?limewash or plaster over joint in ashlar of roof	
10	Polychromy catalogue No.4 - ?ground or plaster in carving of door chevron mouldings	
11	ditto [subject in shadow]	
12	ditto, plaster/ground in moulding of chevron	
13	ditto, further example	
14	Polychromy catalogue No.5 - plaster filling ?hollow in shaft	
27	Polychromy catalogue No.7 - ?paint in hollow of abacus	50mm macro lens + T32 flashgun
28	ditto [portrait]	
29	Polychromy catalogue No.9 - ?ground on bell of capital	
30	Polychromy catalogue No.8 - thin ?ground on wall-shaft	
31	Polychromy catalogue No.10 - medieval repair to eastern bell of capital, general view	
32	ditto, detail of pink surface below joint	

Film: Kodak Elite Professional UC200-135-36

Date: 8-15 December 2004

Camera: Olympus OM4 with 28mm f.3.5, 35mm shift f.2.8, 50mm macro f.3.5 Zuiko lenses and Olympus T32 flashgun

No.	Site	Description	Film title: 2004/7/12 to 32
7 /12	<b>Glastonbury Abbey</b>	South Nave Aisle, N elevation: Bay 6/7 springer of internal flying buttress at triforium level, looking E	P
16	South Nave Aisle	ditto, Bay 5/6 springer of internal flying buttress at triforium level, looking E	P
24		South Nave Aisle, N elevation, termination of window arch in W bay, looking SE	P
29		South Nave Aisle, S elevation: Bay 6, ?mastic repair to attached shaft, W side	50mm macro lens L
30		ditto, trimming of western side of window head for insertion of Perp tracery	P
31		ditto, Bay 5, trimming of eastern side of window head for insertion of Perp tracery	P
32		ditto, Bay 5, lost whole-stone insert on E side of window head	P

Film: Kodak Professional Elite UC200-135-36

Date: 19-26 January 2005

Camera: Olympus OM4 with 28mm f.3.5, 35mm shift f.2.8, 50mm macro f.3.5 Zuiko lenses and Olympus T32 flashgun