

AN ARCHITECTURAL AND TOPOGRAPHICAL SURVEY OF VALE ROYAL ABBEY

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INTRODUCTION

Until recently nothing was thought to survive above ground of the Cistercian abbey of Vale Royal in Cheshire. Founded by Edward I in 1270, it was intended to be the grandest Cistercian abbey in the country. Archaeological excavation in 1911/12 and again in 1958 proved the size and elaborate design of the abbey church but not until the 1970s was it realised that the house which succeeded it was based on two ranges of the monastic cloisters and that these structures survived to roof level.

An opportunity to undertake detailed recording work in the house came about when Mr. Barry Hertzog purchased the property to restore and then subdivide it into flats. A condition of a grant for restoration by the Historic Buildings and Monuments Commission was that this survey should take place at the same time and the cost of the survey came from the Commission's rescue archaeology budget. The project was initiated by Jeff West and Graham Fairclough of H.B.M.C. and Rhys Williams, formerly principal archaeologist, Cheshire County Council. The survey work was undertaken by Robina McNeil and Brian Howes of Archaeological Services, Liverpool University and managed by Rick Turner of Cheshire County Council.

Detailed recording of all the early internal features was carried out in the first half of 1984. In an attempt to date the complex structural sequence, dendro-chronological sampling of the principal roof timbers was undertaken by Dr. Pat Leggett of Liverpool Polytechnic. Also, details of the missing claustral buildings were investigated by a resistivity survey, carried out by Steve Hyatt of Bradford University. Their results are given later in the text.

Basil Pendleton, a Manchester architect, excavated most of the north aisle of the nave and the north transept in 1911 and 1912 and communicated his results to the Lancashire and Cheshire Antiquarian Society. His work was later privately published in an abridged form (Pendleton, 1915). He was able to reconstruct most of the plan of the abbey church, which was found to have an overall length of 421 ft. (128.3 m.), and an overall width across the transepts of 232 ft. (70.7 m.). For some years the main walls were left exposed in the garden and some of the carved stonework became dispersed. Examples can be seen in the former kitchen

garden of the house and in the garden at Toolerstone, Sandiway, near Northwich, where there is a collection of bosses which must have originated from the abbey.

In 1958, Hugh Thompson was asked by the editors of the *History of the King's Works* to establish the plan of both the original and the later east ends of the church. (Thompson, 1962). In a contract of 1359, transcribed by Salzman (1952), the Black Prince called for the building of twelve chapels by William Helpston around the east end of the choir, in addition to the one he had already built. From that document it is clear that the thirteen chapels were to be built as a chevet. Thompson uncovered the apsidal plan of the earlier east end, which may never have been completed (Brownhill, 1914; below), and also determined the unique plan of its successor: seven polygonal chapels alternating with six quadrilateral ones. The construction of these elaborate groups of chapels was to house holy relics; Edward I had given the abbey a portion of the Holy Cross at its foundation (Platt, 1984). Though simpler chevets were built at other English abbey churches, such as Hailes, Glos., and Croxden, Staffs., at an earlier date, the new east end at Vale Royal provides tantalising evidence that in the later 14th century the Cistercians were prepared to make radical experiments with their ground plans, which would herald the elaborate decoration of the 15th and 16th centuries (Coldstream, 1986). The nearest already existing parallels for the complexity of Vale Royal abbey are Toledo cathedral, Spain, with its east end of seventeen chapels, built between 1226 and 1238, or rather later a now lost French church (for comparative plans see Brown *et al*, 1963, fig. 28).

Thompson was also able to confirm that the church had been robbed down to its foundations at the Dissolution, and he speculated that, whilst most of the stone was sold off locally, some was used by Thomas Holcroft, who had later acquired the abbey, in the rebuilding of the west cloister range. He furthermore established that the new east end was built to the parapet level and that the scheme was not abandoned or reduced in height, following the disastrous gale of 1360 (Brown *et al*, 1963).

The finds consisted of sandstone architectural fragments, plain and decorated tiles, window glass and pieces of Purbeck marble. The Purbeck marble fragments found by both Pendleton and Thompson may have been the same as those which were shipped from Dorset to Frodsham for dressing the cloister walk (Taylor, 1949).

In 1977, Graham Holland was asked to prepare a feasibility report for the Michaelmas Trust, a charity which had purchased Vale Royal House and planned to convert the building to an institution. His work, the first attempt to demonstrate that the existing house incorporated monastic structures, was published in 1977, and was also embodied in an unpublished report by the Royal Commission on the Historical Monuments (England). The entry on Vale Royal abbey in the *Victoria History of Cheshire* also benefitted from these ideas, which were refined further by the V.C.H.'s architectural advisor, Tony Baggs (Kettle, 1980).

THE HISTORY OF THE ABBEY

Vale Royal abbey was founded to honour a vow made by Edward I, then earl of Chester, after he had been saved from shipwreck in the Mediterranean in 1263-4. It was not until 1270 that he was able to carry out his promise. The first community, from Abbey Dore, in Herefordshire, arrived at Darnhall, just south of Winsford, in 1273, and took over a manor house and estate of the earls of Chester which had passed to the Crown in 1237 (Brown *et al*, 1963). Four years passed, and a new location was found at what came to be called Vale Royal, in the Domesday manor of Cundersley, a site lying just within the eastern edge of the royal forest of Delamere (Green, 1979). The accommodation at Darnhall may have been regarded as only temporary or may have proved inadequate for the large monastery which was being planned.

Edward and Eleanor, his queen, came to Vale Royal to lay the foundation stone on the site of the high altar in 1277. The extensive early records show how the abbey prospered initially but soon declined, partly at royal whim and partly because of the king's growing financial commitments elsewhere. These events have been well dealt with by Brownbill (1914), Taylor (1949), Brown *et al* (1963) and Kettle (1980) but it is important to outline the history of the building and its repair to show how this is reflected in the standing structures.

An account by the clerk, Leonius, of the building expenses incurred at Vale Royal between 1277 and 1281 survives. The stone came from Eddisbury and was carted to Vale Royal. The timber came from Delamere forest and the carpenters constructed huts, workshops and dwellings for the masons and other artisans, in addition to temporary monastic quarters. These quarters had to last for over fifty years. Large quantities of timber and stone were transported in the first year, but this dropped by half in the next two years, indicating that the temporary quarters were quickly completed.

During the early years of the 14th century, funds for building were small. In a memorandum of 1336, Abbot Peter complained, 'We have a very large church commenced by the king of England. For, at our first foundation, he built it with stone walls, but the vaults remain to be built, with the roof and the glass and other ornaments of the church. Moreover the cloister, the chapter house, dormitory, refectory and other offices remain to be built in a style corresponding to the church' (Brownbill, 1914).

Several points are of interest. The 'very large church' referred to was confirmed by excavation to be 421 ft. long, the longest Cistercian church in Britain, and only a few feet shorter than that at Vaucelles. There appears to be some divergence between Abbot Peter's memorandum and an order of 1287 for ready-made Purbeck marble details for the cloisters. (In 1336, the cloister was considered to be in a style inferior to that of the church). Purbeck marble fragments were found by Pendleton and Thompson but these do not necessarily represent the items described in the surviving document. In 1336, the church would seem to have had a timber

roof and between 1340 and 1342, the choir roof and the northern part of the church were covered in lead at a cost of £100 (Kettle, 1980).

A new patron was found when the Black Prince became earl of Chester. Among the Shrewsbury deeds in the British Library (Add.Ch. 72561) is a writ of the Black Prince, dated 1340, saying he had taken under his special protection the abbot of 'Valreal' and all the abbey property, lest any presume to molest him or it; if any such person was found within Cheshire, he was to be detained in Chester castle and produced at the next gaol delivery. The Black Prince raised the income of the abbey and commissioned the new east end described above. However in 1360, 'a gale blew the nave down from the west end to the bell tower before the gates of the choir . . . The great stone columns fell like trees uprooted in the wind.' The monks applied to Richard II for permission to rebuild the church on a reduced scale. This was allowed and the church was 'reduced in height and width' (Brown *et al*, 1963). Pendleton's excavations did not look at this area and there is no archaeological evidence for the reduction. The west range may have been moved over to the east to fit with a diminished nave. Its alignment is not quite perpendicular to the church or the south range which suggests it may be secondary. An examination of the existing structural remains, however, supports the case for the continual superimposition of the later re-buildings on the same ground plan.

Little is known of the structural changes in the years leading up to the Dissolution, though early-16th-century records throw some light on the state of the abbey and its buildings (Brownbill, 1914). In 1509, the abbot of Dore visited Vale Royal and made a partial inventory. Some rooms were mentioned, including the abbot's chambers, the hospice, the pantry, the kitchen and the brewery. The abbot's chambers were described as containing 'a suitable couch, ten coverlets, four mattresses, two featherbeds and twelve pairs of linen sheets'*. In 1510 and 1515, Abbot William Stratford secured grants of timber for the repair of the abbey buildings, some of which are discussed below. At the Dissolution, the abbey was bought by Thomas Holcroft, who converted the west and south ranges into his country house, a building which underwent many phases of alteration before arriving at its present form.

From fig. 3, it is apparent that the core of the house is an L-shaped block which forms what is close to a right angle with the nave of the church; its alignment suggests that it is a survival from the monastic plan. The preferred layout of Cistercian abbeys, particularly in the 12th century, is well known and many examples are illustrated by Gilyard-Beer (1958), and by aerial photographs in *Monastic Britain from the Air* (Knowles and St. Joseph, 1952). Almost invariably, the principal buildings were grouped south of the church around a

Cistercian monks had moved from their original meditative and simple lifestyle (Moorhouse, * The recently excavated guesthouse at Kirkstall abbey is an example of how far the 1983).

rectangular cloister (fig. 1), except where there were difficulties over terrain or water supply. At Roche abbey, a classic example (Thompson, 1954), the buildings of the east range, taken in order from the south transept, consisted of the sacristy, the chapter house, the parlour and monk's dormer; the reredorter, farmery and abbot's lodgings were in the south-east corner of the precinct. The warming house, refectory and kitchen made up the south range, and the cellarer's building with the lay brother's dormitory above, comprised the west range. Lesser buildings were dispersed around the precinct.

During the life of the Cistercian movement, the position and orientation of the refectory changed. Initially, the Cistercians followed the practice of the Benedictine order and placed the refectory along the south range, as at Basingwerk abbey (Taylor, 1971), but by the mid 12th century, it became general practice to re-orientate the refectory at right angles to the line of the south range to make room for the kitchen to the west, and the warming house to the east. Towards the end of the monastic period, the shrinking communities of monks often used another smaller room to eat in, leaving the refectory for feast days and to the novices. It is not unknown, however, as at Cleeve abbey in Somerset, for a late refectory to be rebuilt or restyled along the south range in the manner of the earliest examples (Gilyard-Beer, 1960; Buckle, 1889).

Initially, the lay brothers carried out most of the manual work in the monastery to which they were bound, but by the middle of the 14th century, hired servants were more common and had virtually replaced the lay brothers as the workforce. Thus their dormitory and refectory were no longer necessary and they were often converted to other uses, such as guest apartments, kitchens or barns (Coldstream, 1986).

This survey of Vale Royal indicates that the west walk of the cloister, a first-floor refectory, the kitchen and the lay brothers dormitory survived at least partially and were incorporated into the house (fig. 2). The cloister garth, which had maximum dimensions of 39.5 m. north-south and 35 m. east-west (130 ft. by 115 ft.), was smaller than that at Beaulieu (Hope, 1906), but larger than that at Fountains (Hope, 1900). The refectory range was on the south side, and the kitchen in its customary place in the south-west corner. The buildings will be referred to under these names in the structural description.

There is no trace above ground of the east range, but the results of the geo-physical survey suggest the outline of the chapter house and the probable survival of its tiled floor. In comparing what remains of Vale Royal abbey with the standard plan, it must be remembered that Vale Royal was a late foundation for a Cistercian abbey, and after the death of its patron it was always underendowed and may never have been completed to its original design.

THE STRUCTURAL HISTORY OF THE MONASTIC PHASES OF VALE ROYAL HOUSE

Summary of the Results of the Survey

The evidence for the function and sequence given here is based on a study of the roof trusses (fig. 4). Additional and complementary information has been obtained from the masonry and details of the timber framing in the walls of the house.

The south range had a timber-framed upper storey above a masonry ground floor, with the central three bays open to a decorated roof and with a single bay anteroom at either end. Dendrochronological dating gives an estimated felling date of 1480 +20/-11 for timbers from the decorated roof and an actual felling date of 1548 for a purlin above one of the anterooms. This would seem to betray the adaptation or repair of this room just after the Dissolution. The reconstruction of the refectory in the late 15th century is known at other Cistercian abbeys and reflects the shrinking size of the monastic community during this period.

The abbey kitchen forms the south-western corner of the house, its roof being orientated east-west. It is of two bays and was originally open through two storeys. The central, false hammerbeam truss survives intact and the eastern tie beam and collar truss has close studding between the members. Evidence for the timber party wall between the kitchen and refectory can be reconstructed. It can be shown that the refectory is later than the kitchen. The kitchen is entered at ground floor from the line of the west cloister walk through a four-centred arched stone doorway, which is probably 15th-century in date (Wood, 1965).

The west range has a less certain history. It would appear eventually to have been of masonry to roof height, and the corbelling and the heavily joisted ceiling carrying the first floor suggest a date late in the 13th or early in the 14th century. The roof is complex and of four major phases; the first two of these are monastic and the third may represent adaptations just before or just after the Dissolution. The earliest phase is represented by the south gable truss, carried on posts rising from the first floor, an indication that at that date the upper storey at least may have been timber-framed. This may belong to the building's earliest function as the lay brothers' dormitory. The second phase consists of a simpler but more massive roof of which two trusses survive intact. This may indicate the conversion of the dormitory into a storehouse. In the third phase this rather plain roof is cleverly converted into a series of decorative trusses above a first-floor great hall in the north half of the range, a screens passage at the centre and an open chamber and service rooms to the south. The screens passage was entered from a raised porch with an external stair on the west side. This arrangement may have resulted from the remodelling of this range as an abbot's lodging, or perhaps more from likely Thomas Holcroft's conversion of the range into the centre of his country house.

The ground floor of the west range is more problematic. Though no structural details can be shown to belong to the monastic period, it appears to have been a cloister walk contained within the range and lit by glazed windows. If that was

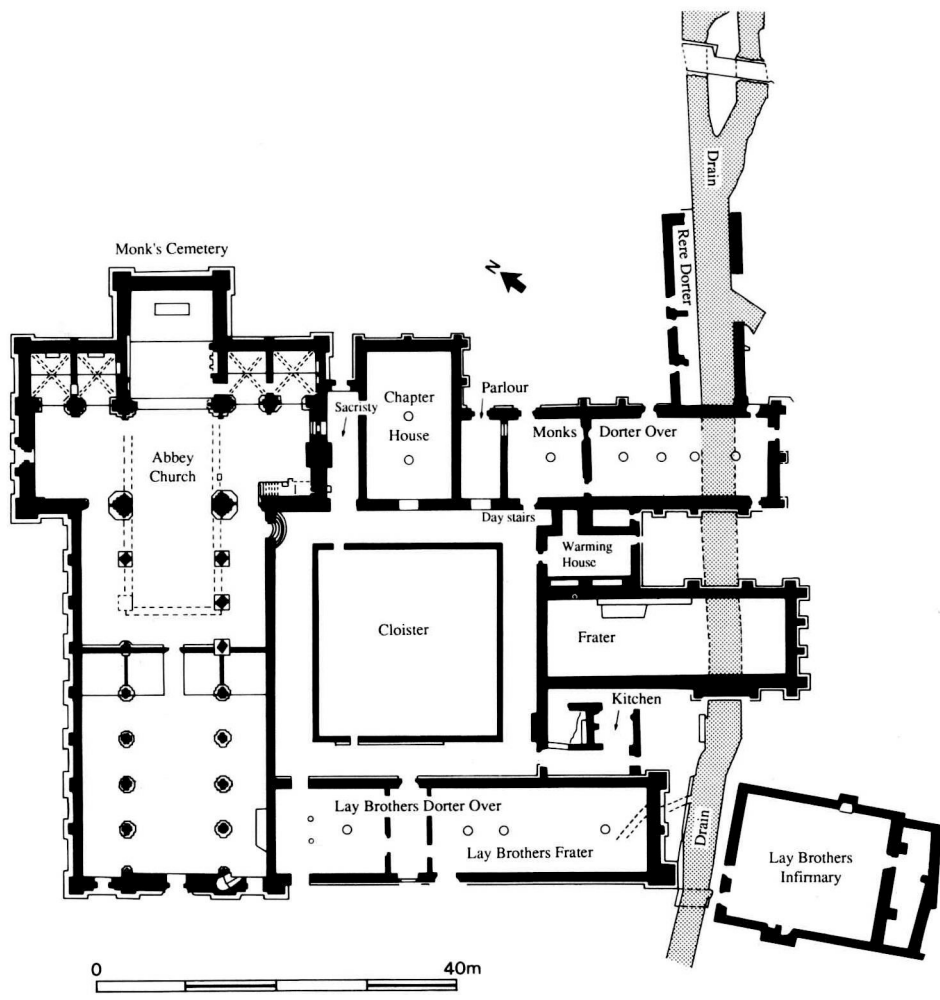


Fig. 1: Roche Abbey.

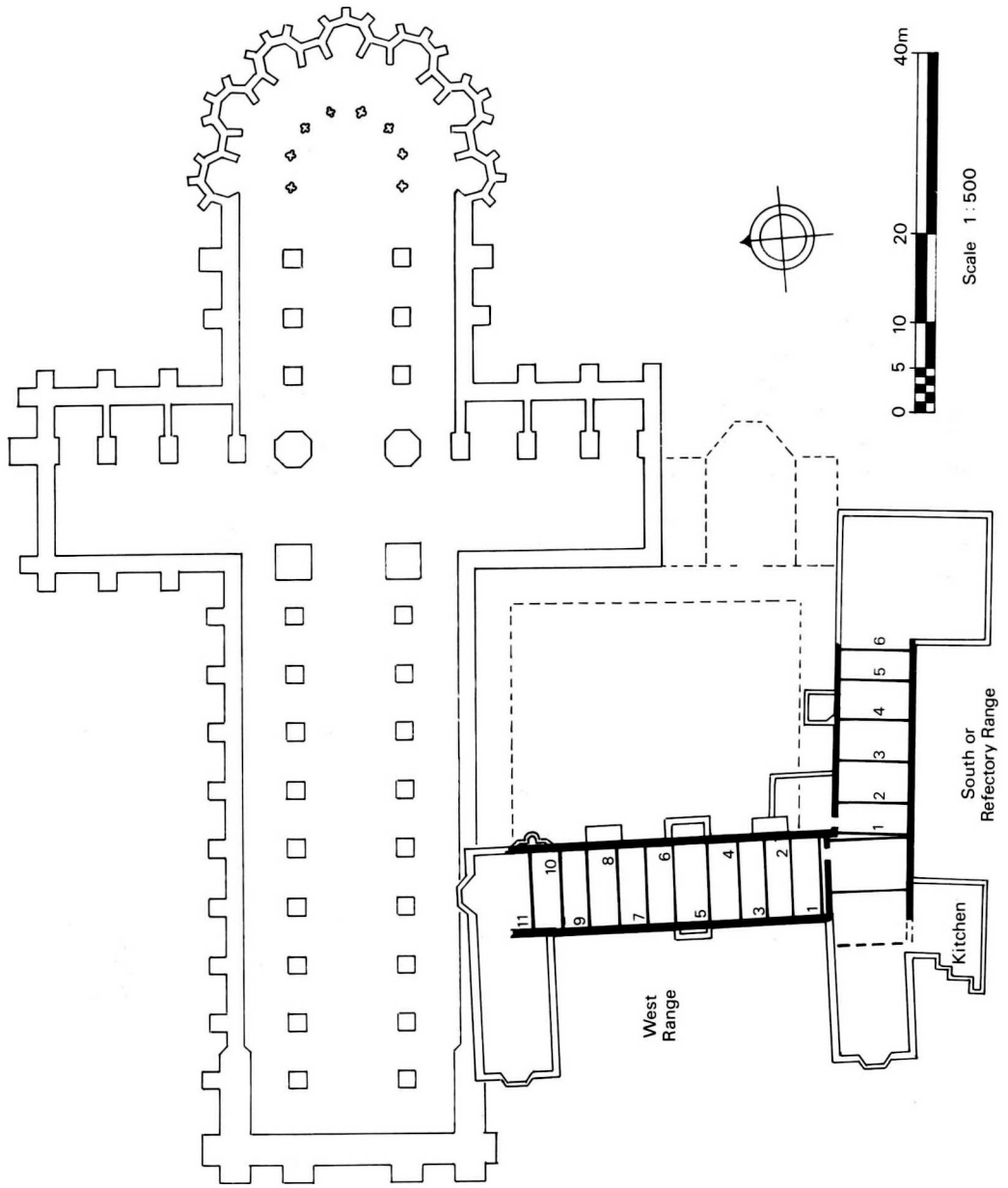


Fig. 2: Location of surviving medieval fabric within the present house.

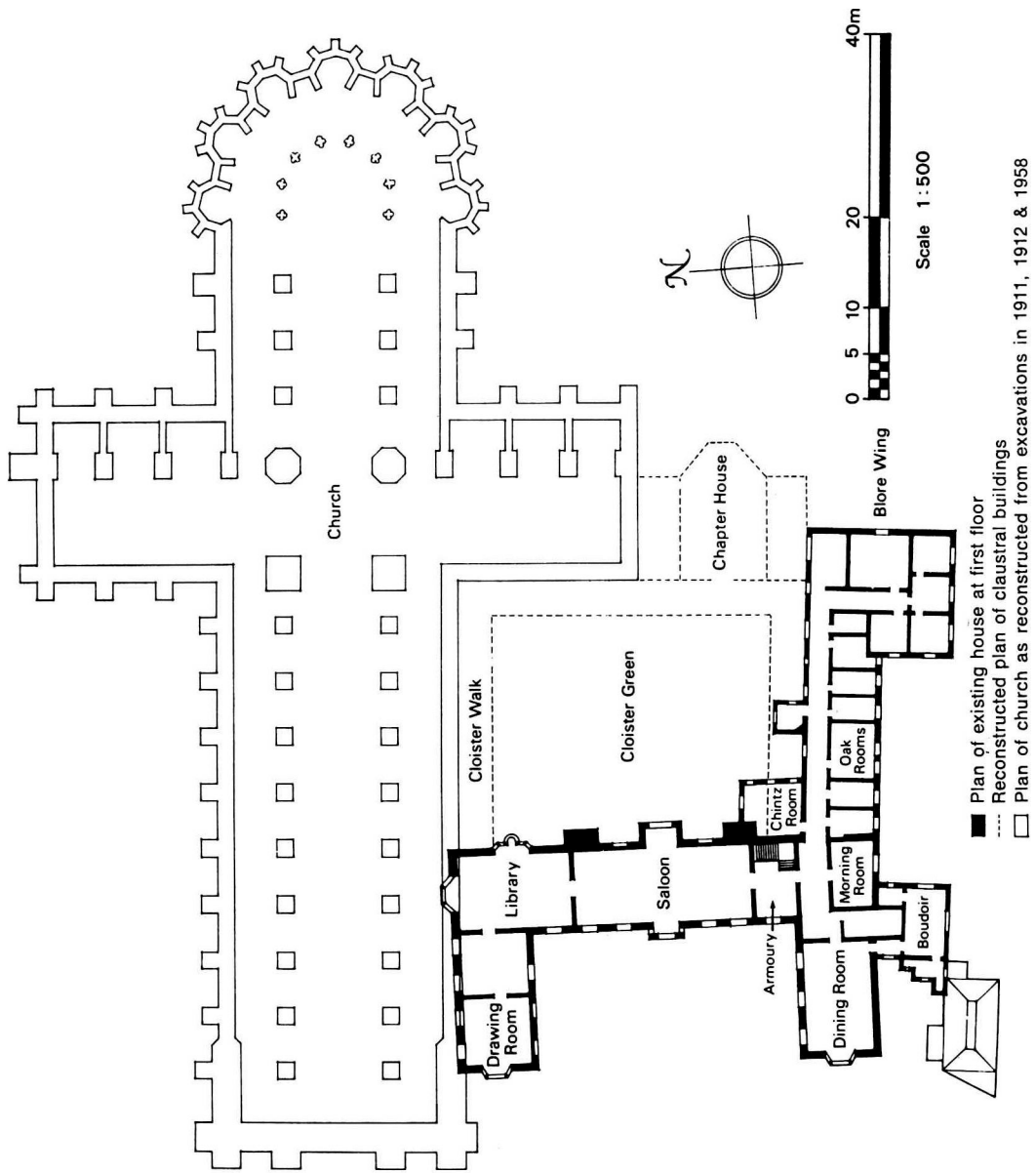


Fig. 3: Vale Royal House in relation to the monastic plan.

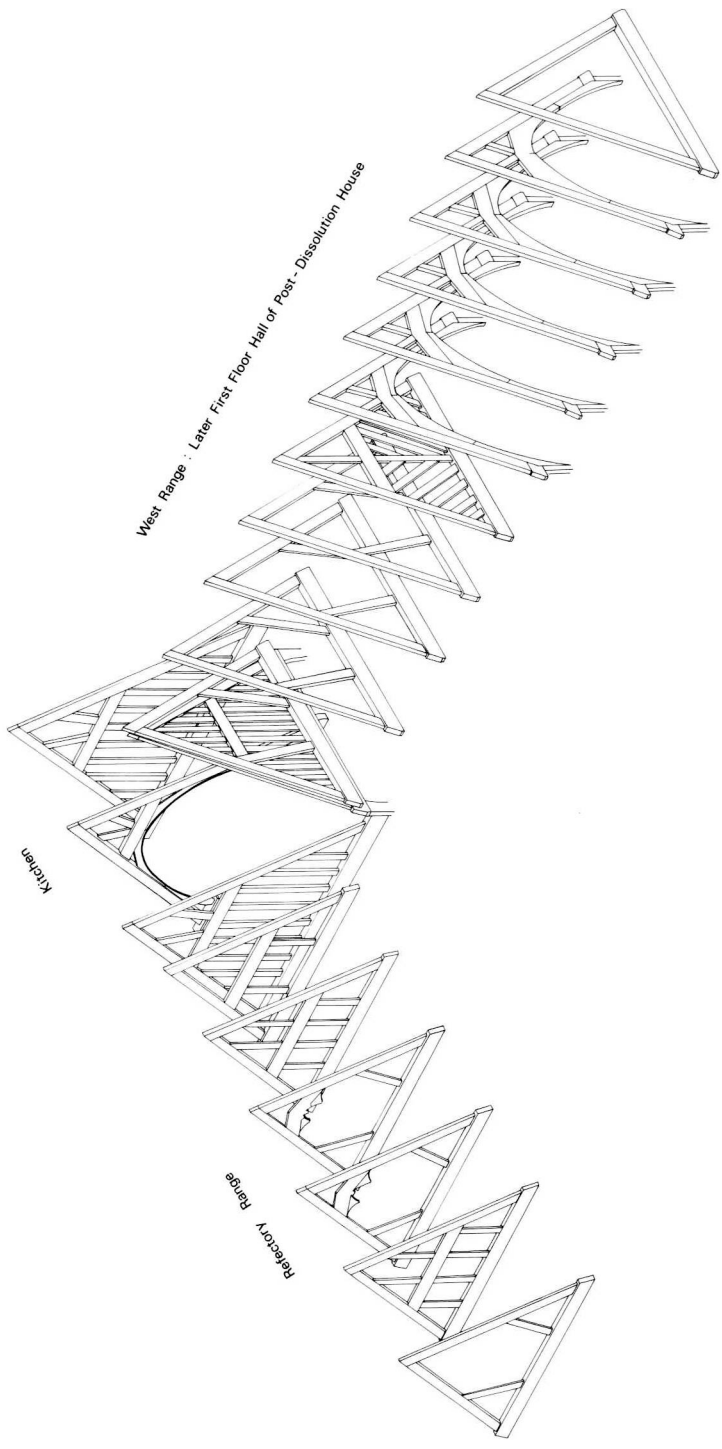


Fig. 4: General isometric reconstruction of the roofs derived from the claustral buildings of Vale Royal Abbey.

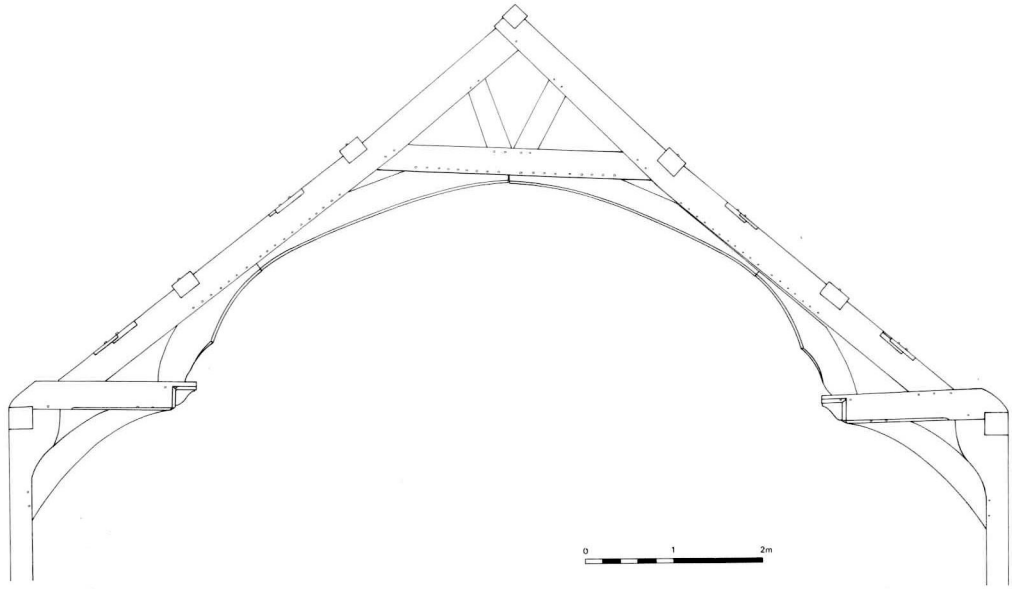


Fig. 5: The central false hammerbeam truss in the abbey kitchen.

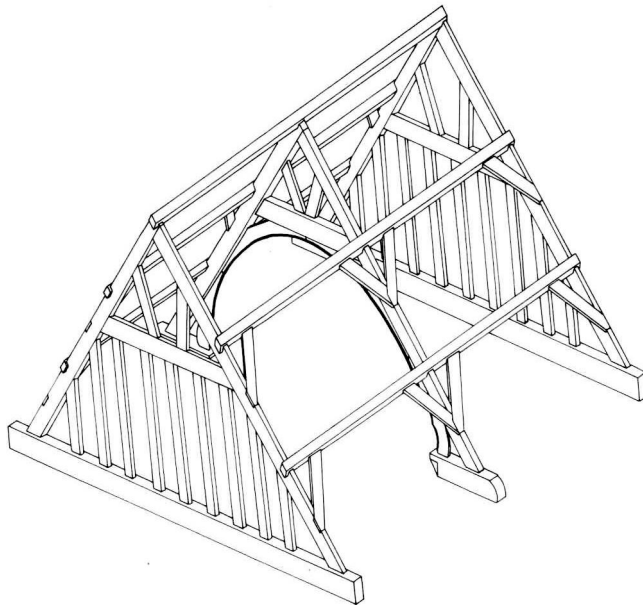


Fig. 6: Isometric reconstruction of the abbey kitchen roof.



Fig. 7: The doorway to the kitchen from the line of the cloister walk.

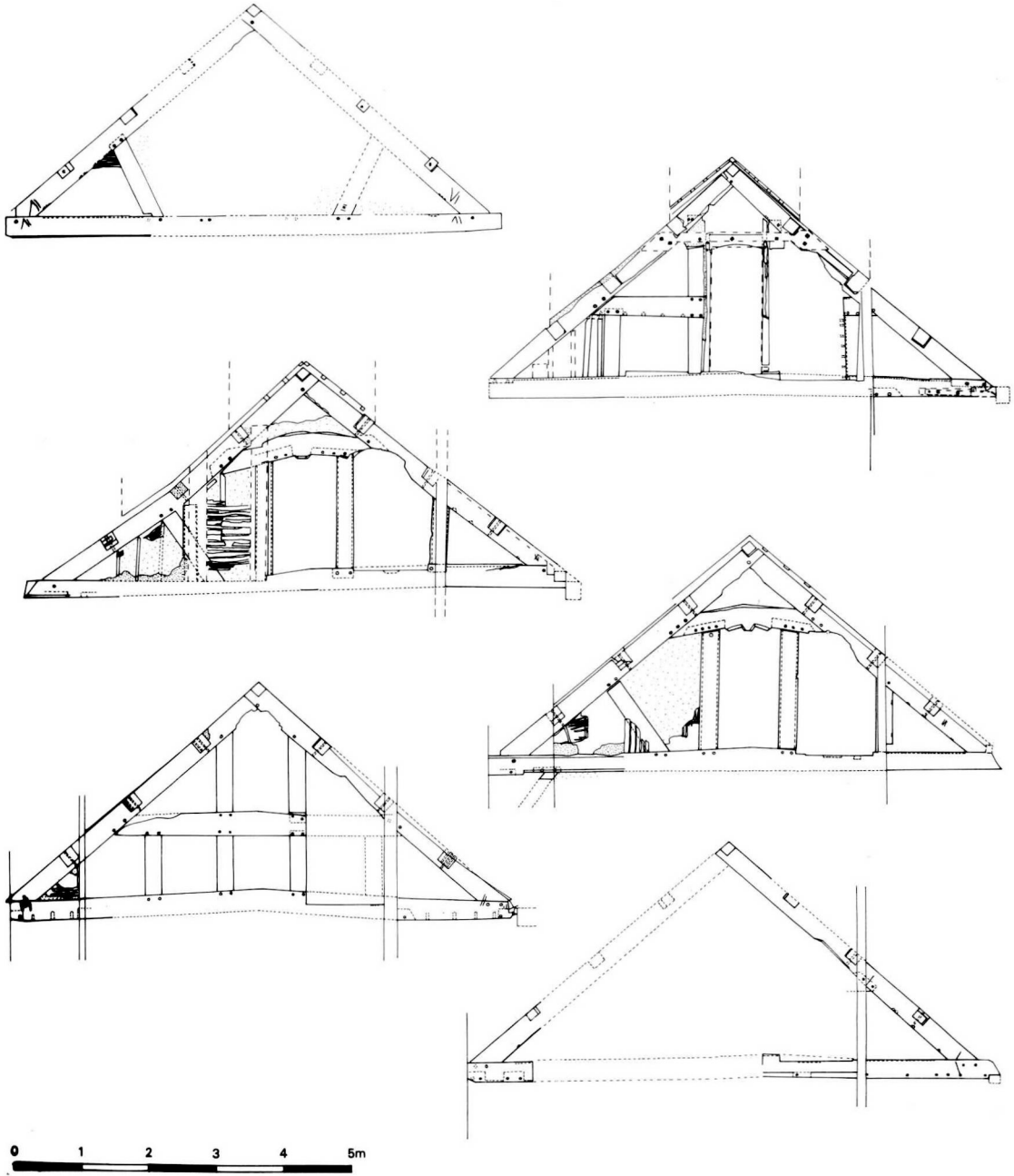


Fig. 8: The six roof trusses of the refectory range.

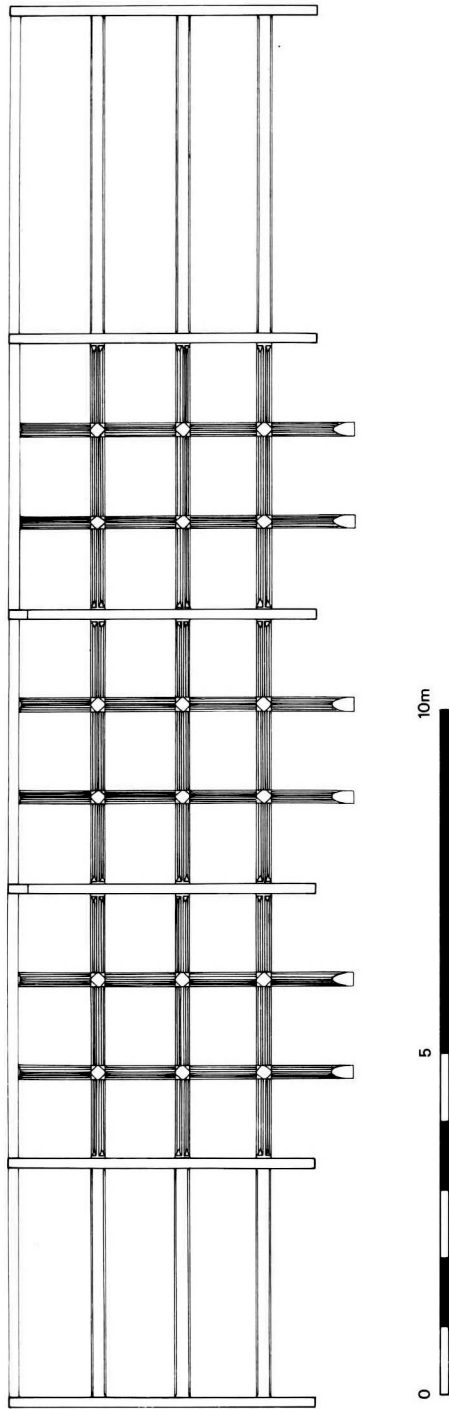


Fig. 9: Elevation of one half of the moulded roof members in the refectory range.

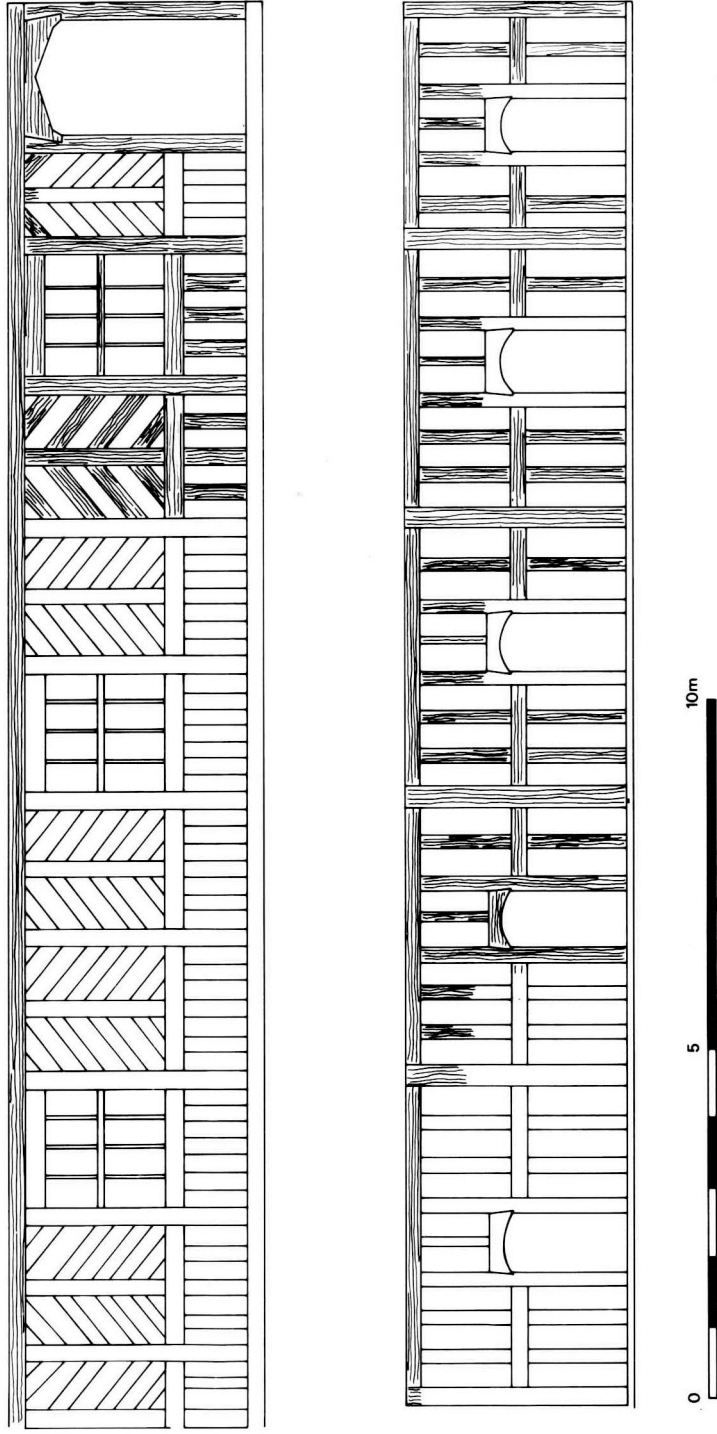


Fig. 10: Elevation of upper storey of north wall of refectory range and corridor wall behind.
The shading shows what survives.

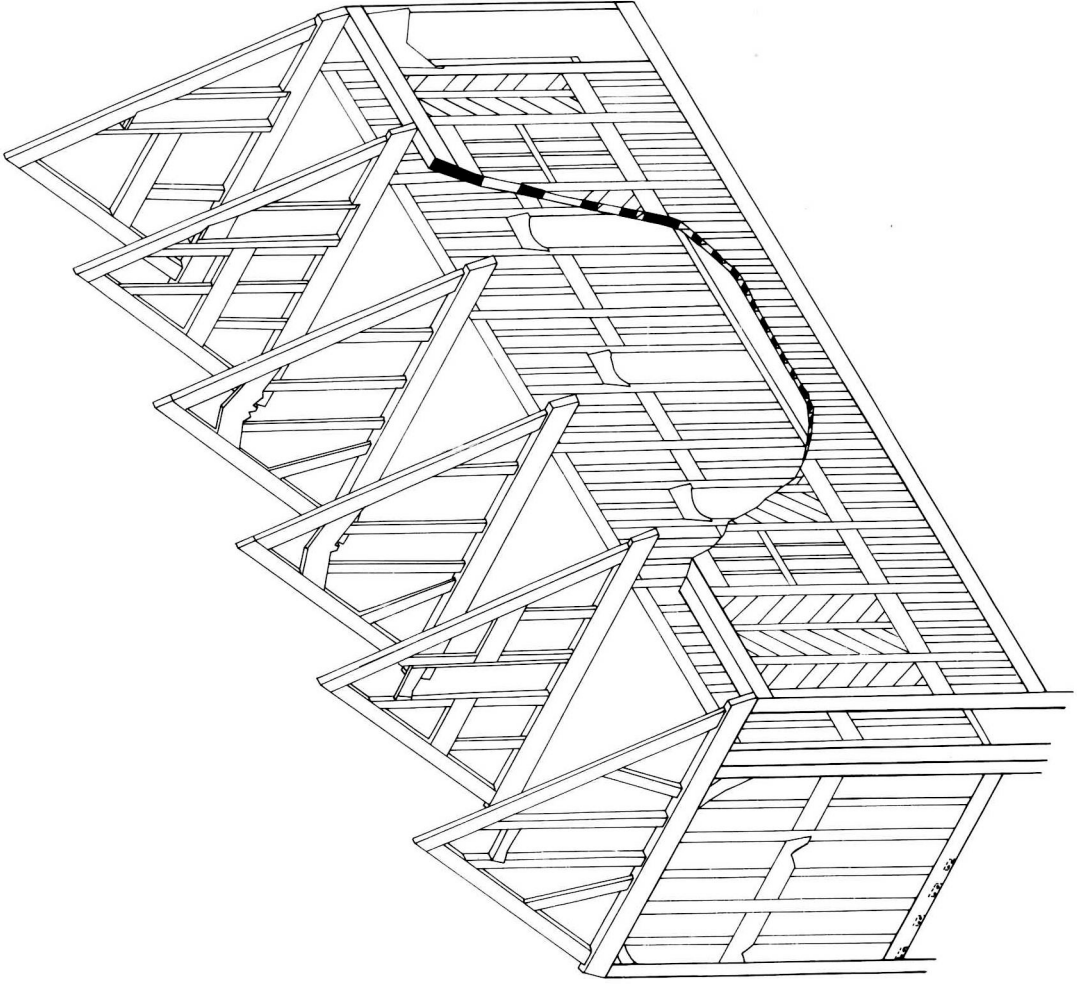


Fig. 11: Cut-away isometric reconstruction of refractory range as adapted after Dissolution.

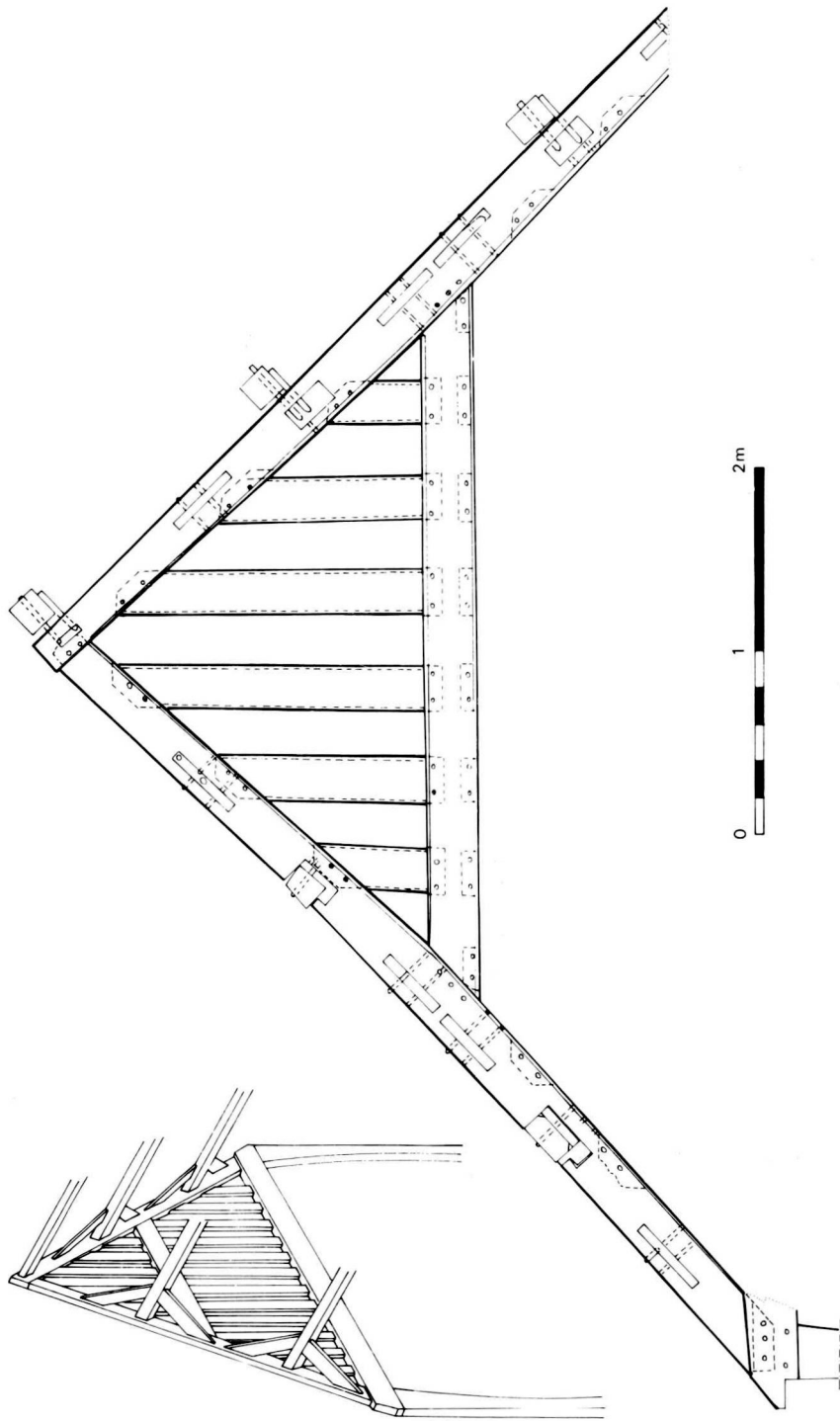


Fig. 12: Elevation of southernmost truss in the west range with isometric reconstruction.

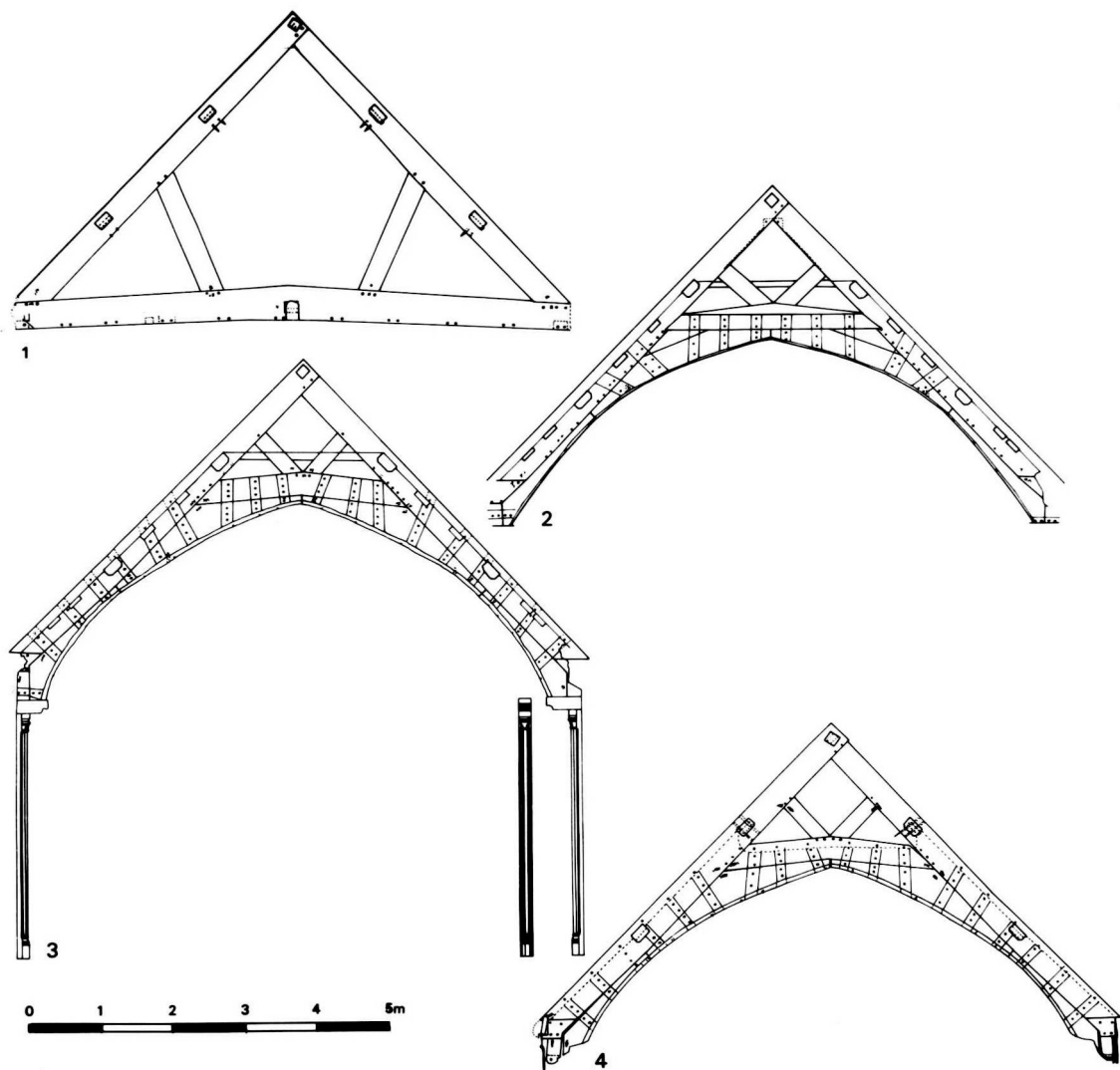


Fig. 13: Elevations of selected surviving trusses from west range.
1 — Armoury roof space; 2 — Filled truss; 3 & 4 — Trusses above hall.

the arrangement *ab initio* it would have been exceptional. A cloister walk within the range is almost unknown in rural ecclesiastical houses (though Cleeve abbey is again an exception), and glazing is a feature of the latter remodelling of cloisters. The remainder of this floor may have been part of the cellarer's storage space (normally vaulted).

In sum, it is clear that the present plan of the house has been adapted from the carcase of the south and west ranges of the abbey's claustral buildings.

The South Range

The kitchen, which filled the corner formed by the other two ranges, was c.9 m. long and had a span of 11 m.; it was originally open from the ground floor to the roof (fig. 6). Its main feature is the central arch-braced false hammer-beam truss (fig. 5); the arch bracing was carried on the principal rafters and moulded collar. The ends of the hammerbeam were moulded in a simple manner, as might be expected in such a functional room. The truss has chamfered, trenched purlins and four straight-sided windbraces. The eastern truss (fig. 6) was a gable end with close studding between the tie beam and collar. The same can be reconstructed between the tie beam and the bressumer, which either no longer exists or cannot be seen. The purlins in this roof run from east to west, but have been cut off c.4.5 m. from the central truss and no western gable survives. The western gable truss can be seen in a view of 1775 (fig. 22) and is technically identical to its eastern counterpart.

The kitchen is entered from the west cloister walk, through a moulded four-centred arched, stone doorway (fig. 7). On the ground floor is a massive 19th-century fireplace, which may indicate the position of the original. Monastic kitchens were often kept in use long after the Dissolution; that at Durham cathedral was the dean's kitchen until the 1930's. The inventory of 1509, mentioned above, gives the following fittings, 'six brass pots, four spits of iron, two "rakkings" of iron, one mortar of brass with stand of iron, one "garnesh" and pewter vessels' (Brownbill, 1914). 'Rakkings' would appear to be a framework for carrying spits, and 'garnesh', a set of pots for the table. The first major alteration to the kitchen was the insertion of a floor at second storey level to link with other attic rooms. The function may have been retained, but as the room was open through two storeys, circulation around the house must have been difficult.

The first floor may not have been created until the 18th century and what survives is of the 19th century. The span of the room was so wide that a brick pier had to be built to carry the main ceiling beams. At first floor, a corridor was created, the Delamere Lobby, with a glazed tunnel vault lit from a skylight.

The refectory range is lower than and butts up to the eastern wall of the kitchen. At first-floor level these two buildings are on a slightly different alignment, with the refectory being the later addition. The refectory was a first-floor, central, open hall, with a small anteroom of one bay at each end. One of these rooms was probably the pantry and the other a lavatorium. The inventory of 1509 mentions

9 new cloths ('nappe') and 4 old ones, 6 silver spoons, 7 candlesticks and 4 napkins in the pantry (Brownbill 1914). Originally there were at least two more bays to the east, where the warming house would have been located. There is no evidence of this structure in the roof, but there are some indications in the wide ground-floor passage in the south-east corner of the building that this range extended at one time at least this far. The roof consists of six trusses, which are numbered with carpenter's marks from 1 to 6 running from west to east, the marks being found on the tie beams or principal rafters. The trusses will be described in sequence (fig. 8).

Truss 1 has been badly damaged in recent times, but in its finished form it consisted of principal rafters, tie beam with studs below and a collar. The space in the eaves was filled with wattle and daub. Queen struts must have been present, but not enough of the truss survives to predict their number. Truss 2 consists of a tie beam, collar and queen posts and was closed with wattle and daub panels. Trusses 3 and 4 differ in detail from each other, but belong to the same general class, in which there is a slightly cambered tie beam and shaped collar with a pendant central boss. These two trusses were designed to be viewed from the first-floor refectory. In truss 3 the moulded design on the central boss is continued on two projecting wings, whereas truss 4 has a moulded central boss only. Both trusses have long mortices and unfilled peg holes, presumably intended to carry an arch brace to the tie beam. Both display a looseness and carelessness in the way the members were chosen and assembled. Truss 5 is constructed with a heavy collar and queen posts and is structurally identical to its western counterpart, truss 2. Owing to the modern partitioning, truss 6 was difficult to examine; it consisted of a tie beam and diagonal struts with wattle and daub filling the corners, which probably formerly extended right across the truss.

The roof of the refectory was divided by trenched purlins (fig. 9) and short cross timbers, producing a grid effect. The cross timbers were only pegged through from the common rafters and were not keyed into the purlins. The timbers were moulded in the double concave and bird mouth design, giving the refectory a highly decorative ceiling. This effect was further enhanced by leaving a flat diamond plane at the intersection between the purlins and cross timbers, whose face may have been brightly painted or used to affix a small boss or rosette. An early floor was recognised beneath the present first floor, the extent of which falls within the three central bays of the refectory. The floor was built with large joists, into which transverse laths were inserted. The space above the laths was mortared for a flat floor, whilst that below was plastered for a cambered ceiling.

In this state the refectory appears unfinished. Many of the timbers fit badly together or have unexplained mortices and peg holes. Holland suggested that the roof was dismantled and then reassembled, using as many constituent parts as possible (Holland, 1977). A likely time for the rebuilding was when the first-floor timber framing was inserted. It has not been possible to establish how much of the roof was dismantled, or how many timbers were replaced by new timbers or

reset in their approximate positions. The principal rafter in truss 5 gives an estimated felling date of 1480 and it is unlikely that the main framework was completely dismantled. The dates for the two purlins are somewhat contradictory, falling either side of the dissolution. What probably happened was a piecemeal rearrangement, using the decorative timbers from the refectory ceiling. The refectory roof cannot be studied in isolation from the timber framing on the first floor.

There survives a short section of timber framing, which was sealed within the inner wall, when the Chintz Rooms and servants' block were built in the angle between the south and west wings in 1820. The remainder was probably removed in 1860 by John Douglas when he encased the south wing in brick (Pevsner and Hubbard, 1971). Fortunately, the wall plates were left *in situ*, which enables the timber framing to be reconstructed for almost its complete length (fig. 10). The reconstruction is based on the grouping and spacing of the peg holes on the surviving sections and on the number of scarf joints, joining the wall plate lengths together. All the roof trusses are supported on principal uprights. The timber framing is decorated with chevrons above a middle rail with close studding below. Alterations to the timber framing can be seen in the section next to the wooden doorway, where the panel above the middle rail has largely been replaced by horizontal and vertical studding, although a short length of the original decorative framing and its corresponding peg holes are still visible. The rather crude window is divided into eight lights by the chamfered mullions and transom, which were tenoned top and bottom and at either side into the frame. The window sill, now removed, was fixed to the frame by nails. An examination of the joint above the window indicates that the window was inserted into the timber framing. The doorway has a four-centred arch. The doorhead is chamfered on the underside and partly down both faces and has a line of holes on the reveals, suggesting that it was blocked at some time. The door is in the right position for a day stair giving access to the cloister garth and, as Thomas Holcroft may have had no need for an entrance at first floor at this point, he probably sealed it off.

The first-floor refectory and anterooms of the abbey were converted into a line of five small apartments, with one apartment per bay division. Each apartment opened on to a corridor which ran along the north side of the range. The inserted timber partition was constructed from closely spaced studs, set above and below a central rail. Only one apartment door is intact today and consists of a depressed arched doorhead with chamfered sides. The position of the remaining doorways can be extrapolated from the size of the vertical studs. The doors are positioned at the centre of each bay and each door has a narrow stud above it in contrast to the wider studs of the timber framing (fig. 11).

The second storey was floored and the attic space was similarly partitioned, into mean rooms, probably as accommodation for servants and as part of the same refurbishment. All the roof trusses were modified to some extent. This either took the form of closing the trusses or inserting doorways into them. All

these remodellings were crudely executed. The collar in truss 2 was sawn off beyond the queen strut, and in order to make enough headroom for a door, the tie beam was shaved down at the appropriate point. It can be seen from fig. 8 that this operation involved the least possible work. With trusses 3 and 4, diagonal struts were inserted above the tie beam and ill-fitting queen struts were placed either side of the central boss to house a doorway. The queen struts have grooves for wattle and daub down both faces, indicating that they were reused timbers, although the central doorway was never closed in this position. The rest of the truss was walled with wattle and daub and rendered with a fine red plaster, which lay flush with the timbers. The bosses appear to have their ends cut off, perhaps because they were ecclesiastical symbols, but not by an appreciable amount. In the case of truss 5, the collar was sawn off between the two central queen struts and a door was inserted. The only way to make the door fit was to insert two door jambs, one within the other. The doorhead was a single piece of wood, flat on the top and curved on the underside. Truss 6 was also altered to make a central doorway, which lined up with the doors in the next three trusses, and thereafter access was inside the north wall.

The insertion of dormer windows at various intervals removed lengths of purlins and cross timbers. Some of the internal attic partitions were later refaced with lath and plaster. In the 19th and 20th centuries, further damage to the roof trusses was caused by building work when new doors were inserted. The five first-floor apartments were later remodelled into four larger ones, so the size of the new and present rooms no longer reflects the original bay divisions.

The internal timber-framed wall below truss 6 was in small framing, with almost all of the members being reused timbers with a profusion of empty peg holes. The arch bracing fits against the south external wall and against the timber partition on the north, implying that the partition was the earlier insertion. The doorway to the south may be an original feature, whereas the central doorway is obviously of a later date. There are two graffiti scratched in the plaster. One is a tree of life (or a tree of Jesse) and is probably contemporary with the rebuilt wall, the other is the signature of a child, Piers Hopkirk?, who may be a relative of Mary Hopkirk whose father rented Vale Royal House from the Delamere family in the early years of the 20th century. Stylistically the writing looks to be of an earlier date. The bressumer can be seen in part, with mortices below. It is chamfered on its east face, and the evidence suggests that at one time the range continued further east for a possible two bays.

At ground floor, there are several anomalies in the plan, which are inconsistent with a Tudor house. There is a long narrow room now used for a lavatory, whose walls are between 0.6 and 0.9 m. wide and are made from well coursed blocks of stone. The stonework has been rendered, but was visible when Graham Holland surveyed the building in the 1970s. He noticed that the walls were deeply scored, as if they had been exposed to the wind in an external passage. This is the wrong side of the cloisters for access to the outer courtyard. Where such passages exist,

they are found in the cellarers' or west range, providing a link between the secular and religious worlds, as at Norton priory, with its splendid vaulting and stone *sellae*. There is no evidence that Thomas Holcroft required or even considered a second courtyard. The best explanation for this passage is that it is the monastic lane between the refectory and the west range. Fountains abbey has a passage in a similar position (Hope, 1900). This passage offers the only indication that the original refectory projected south from the cloister and was later reorientated to lie parallel to the cloister.

A wide corridor separates the south range from the Blore wing, which was added to the former's eastern end (see fig. 1), and which itself replaced an earlier wing (see fig. 22). It was impossible to view the foundations, to determine whether they were stone-built, but above ground the walls are of brick. As the corridor does not form the entrance hall to the Blore wing, it may be considered an obstacle, which had (by necessity) to be incorporated into the wing. Comparison with other Cistercian foundations suggests that the corridor, with its position in the corner between the south and the putative east range, formed the passage and day stair leading to the dorter. At Cleeve abbey such a passage survives and is incorporated into a later building (Buckle, 1889), whilst the passage at Roche abbey has similar proportions to that at Vale Royal (Thompson, 1954).

The first internal wall east of the kitchen is timber-framed. The wall has been plastered over, but it is possible to see in relief the outline of large simple square panelling and a door with a pointed doorhead. This style of timber framing is comparable to that on the first floor below truss 6.

The West Range: Roofs and First Floor

Phase I: The roof of the west range was completely rebuilt (phases II-IV), leaving one truss from an earlier roof (phase I). This truss, situated above the present armoury, was a southern gable end for a range extending north for an unknown length, but no doubt ultimately joining the nave. The gable end was constructed with a collar, tie beam and intermediate studs and housed straight wind braces (fig. 12). One of the principal uprights of this gable survives, implying that the range was timber-framed at least at first-floor level, or was in stone with timber-framed partitions. The members were chamfered on their south face, but were flush with each other on their north face. As no further trusses of this period survive in this range, little can be added about the details of construction, methods of jointing or the internal divisions. The purlins in the armoury roof space are all reused and are all different. Most likely they are purlins reused from a wind-braced roof, and possibly that roof belonging to the end gable. The relationship of the kitchen roof to the west range was established by an examination of the relevant timbers, where the gable end was demonstrably earlier than the kitchen roof and by implication earlier than the refectory roof, the latter dated by dendrochronology to c.1480. This gable is therefore of the monastic period at Vale Royal and probably formed part of the lay brothers' range.

Phase II: There is good evidence to suggest the new west range (phase II) was built with stone walls from the first. The unaltered truss 2 always rested on stone walls, and the arch-braced roof of the main hall relates to the existing masonry walls (fig. 13). It was not possible to view all the joists, but where the floorboards had been removed, sections were available for examination. The present library floor rests on a mass of joists of varying dates: the largest ones in the southern half of the room may be *in situ* from an early phase or may be reused. The early floor was supported on stone corbelling, a section of which survives in the south-west corner. Adjacent to these corbels is a reused fragment of carved stone, perhaps a piece of window tracery or blind arcading (fig. 19). This fragment suggests that Thomas Holcroft partly rebuilt this range in stone. A similar arrangement of corbels, which carry a timber beam, is found in the outside wall of the corridor below the library. This technique of a stone corbel table, along which rests a timber beam, on which are laid closely spaced and massive joists, is being found in town houses in Chester and in other types of building elsewhere in the Welsh Marches, dating to the reign of Edward I and the first quarter of the 14th century. In these examples it takes the place of stone vaulting as the method for carrying the principal floor (Turner, 1988). Extensive renovations took place in 1877, leaving the date of this section in doubt. The internal wall of the same corridor was timber framed, with only the bressumer with mortices on its underside remaining. Again it cannot be established whether this timber is in its original position or whether it was moved in 1877. There are simple corbels and posts below the trusses of the great hall, which are shown in a photograph taken in 1914 (Ches.R.O., Vale Royal Special File), but are not visible in a mid-19th-century print of the interior (Twycross, 1848). The present wall posts are therefore late-19th-century in date, replacing early-19th-century posts, which may perpetuate an earlier arrangement.

The phase II range may have terminated against or alternatively preceded a two-bay block at its northern end. This block, now demolished and replaced by the north-west wing and the rebuilt library, can be seen in a print of 1774 showing the rear of the house (fig. 23) and both in the outline of the roof and in the number of bays it resembles the kitchen. It is evident that the north block, whatever its date or function, was built to balance the kitchen block. It remains unclear whether it was built in conjunction with the phase II range, or whether it predated it.

Unfortunately the results from dendrochronology for all members of the phase II roof in this range were inconclusive and cannot be used either to date the initial construction or any subsequent modifications. Nine trusses of the roof survive. The trusses are numbered 1 to 9 with carpenters' marks, commencing at the southern end, but there were in addition two more trusses. Some of these trusses are illustrated in fig. 13. It is known that the roof of the present great hall continued; 'Upon pulling down, in 1827, an internal wall beyond the present room (great hall), it was found to extend 24 ft. further and the end wall was of ornamental

black and white panels with a gallery at the top open to the room' (Bartlett and Stovin, 1851). Concealed behind the panelling of the library is an arch-braced truss (truss 9), so if the spacing given by Bartlett and Stovin is correct there is provision for one further truss between the last survivor and the end wall. There is some variation in the manner and position of the carpenters' marks and it is possible to argue that sections of the roof were totally rebuilt or built at a later date, using the original numbering system. Truss 1 is not a gable end, but this does not necessarily present a problem in interpretation; the new range did not require a closed southern truss as the gable from the lay brothers' range was still standing and the adjacent kitchen block still functioned. The new roof oversails and utilises the earlier end gable and by a rather clumsy arrangement the ridge pole is carried on through into the kitchen.

It has proved impossible to work out the complete sequence of this roof's history, as the various stages cannot always be isolated from or correlated with each other. Inevitably, some of the stages may not have been recognised, whilst others have been only partly understood, but the following broad sequence of development is considered to be both economical in detail and also the most acceptable one. The range originated as the lay brothers' (phase I) building, and was then remodelled to form the unsubdivided phase II structure with its simple roof. This roof was then modified to give the following divisions, a small one-bay room (trusses 1 & 2), a three-bay chamber (trusses 2-5) and a larger five-bay hall (trusses 6-11) with a screens passage between trusses 5 and 6 (phase III). Finally the hall was repositioned and enlarged by placing it in a central position within the range; false walls were constructed at either end of the hall and the present library was created out of two rooms (phase IV).

The rebuilt (phase II) roof was of a simple, tie-beam construction, with additional diagonal bracing traceable in trusses 1-4. There was an internal timber-framed partition below truss 4. The roof is simple in its design and crude in its execution, employing massive timbers with few decorative traits (for a suggested reconstruction see fig. 14). The best explanation for this roof is that at the end of the 15th or beginning of the 16th century the monks, having dispensed with the lay brethren, demolished the wind-braced roof except for the gable end, and rebuilt the upper storeys of the range as a store or granary. The future changes to the roof can be seen as attempts by Thomas Holcroft, Lady Cholmondeley and later the Delamere family to disguise the modest origins of the building.

Phase III: The most significant change in the next stage was the creation of a great hall entered from a screens passage. The southern half of the range was partitioned into two rooms, but the roofing timbers remained unaltered. Truss 5 aligns with the south side of the present bay window. The mortice configurations in this truss show that it was closed above the tie beam with diagonal studs morticed into a king post (fig. 15) and tall panels below. The screen, although not surviving, was reported to have 'open arches' leading to the great hall. The

screens passage was only finally demolished in 1811, when its presence was recorded by Henrietta Cholmondeley (Ches.R.O., DBC 1/11). The roof of the great hall was restyled for aesthetic reasons; the tie beams were removed and replaced with more decorative arch bracing. The arch braces are of four parts and were suspended from the rafters by through tenons, the number of tenons varying from four to six (fig. 13).

A small lantern is visible on the drawing of the house dated to 1616 (fig. 21). Its remains (fig. 16) were identified in a position central to the great hall. It was built on to the purlins between trusses 8 and 9 and perhaps was intended originally to support a louvre. A timber raft was constructed between the rafters; next four triangular panels were inserted at the corners of the raft, and then four shorter members, laid parallel to the rafters, were added to give extra stability to the framework. The louvre was built as a lath structure on batons and the whole plastered over, to give a smooth finish. The plaster extends over the arch bracing, so in its finished form the louvre is contemporary with or postdates the arch-braced roof. The rude nature of the batons for the plaster contrasts with the well finished and chamfered woodwork of the raft. The difference in design may indicate that the raft was an earlier construction, with the lantern being added as and when required. There is a small fillet of plaster, which appears to predate the plastering of the lantern, but postdates the collar of the arch bracing; the plaster is both obscured and damaged, but suggests a cambered ceiling somewhat like that of the present great hall. The louvre could have been used for lighting, ventilation or smoke. It is unsooted, so it is more likely to have been used to light the room generally or to light the dias specifically. Not surprisingly, its discovery in 1827 with a casement still glazed in it, was totally unexpected (Ches.R.O., DBC 1/11).

Behind the panelling at the end of the great hall are the remains of the earlier plastered wall and ceiling. The plaster forms a covering to a simply arched opening, and in the south-west corner of the room it is contemporary with the architrave of the window. To be seen in the east wall of the library at its southern end, are two phases of fireplace, sealed by the plaster. The later one is set in the brick blocking of an earlier moulded stone fireplace. Both fireplaces belong to the great hall before its remodelling in 1811. The larger fireplace is associated with a massive chimney stack. The size of the blocks used and the regular coursing between the stack and the exterior wall shows that the two structures are well bonded and contemporary with each other. The south stack is not so well bonded into the masonry, suggesting that it was not built as one of a pair, but was a later addition. It is unlikely that the chimney stack was built to serve a monastic range, nor to project into the cloister and its form suggests a post-medieval date. Access to the fireplace was extremely limited, so a full reconstruction has not been attempted. It was designed with a flat lintel and a moulding to the joint (fig. 17), with a triangular relieving arch above. If it was incorporated into the original structure, by symmetry, the fireplace becomes nearly

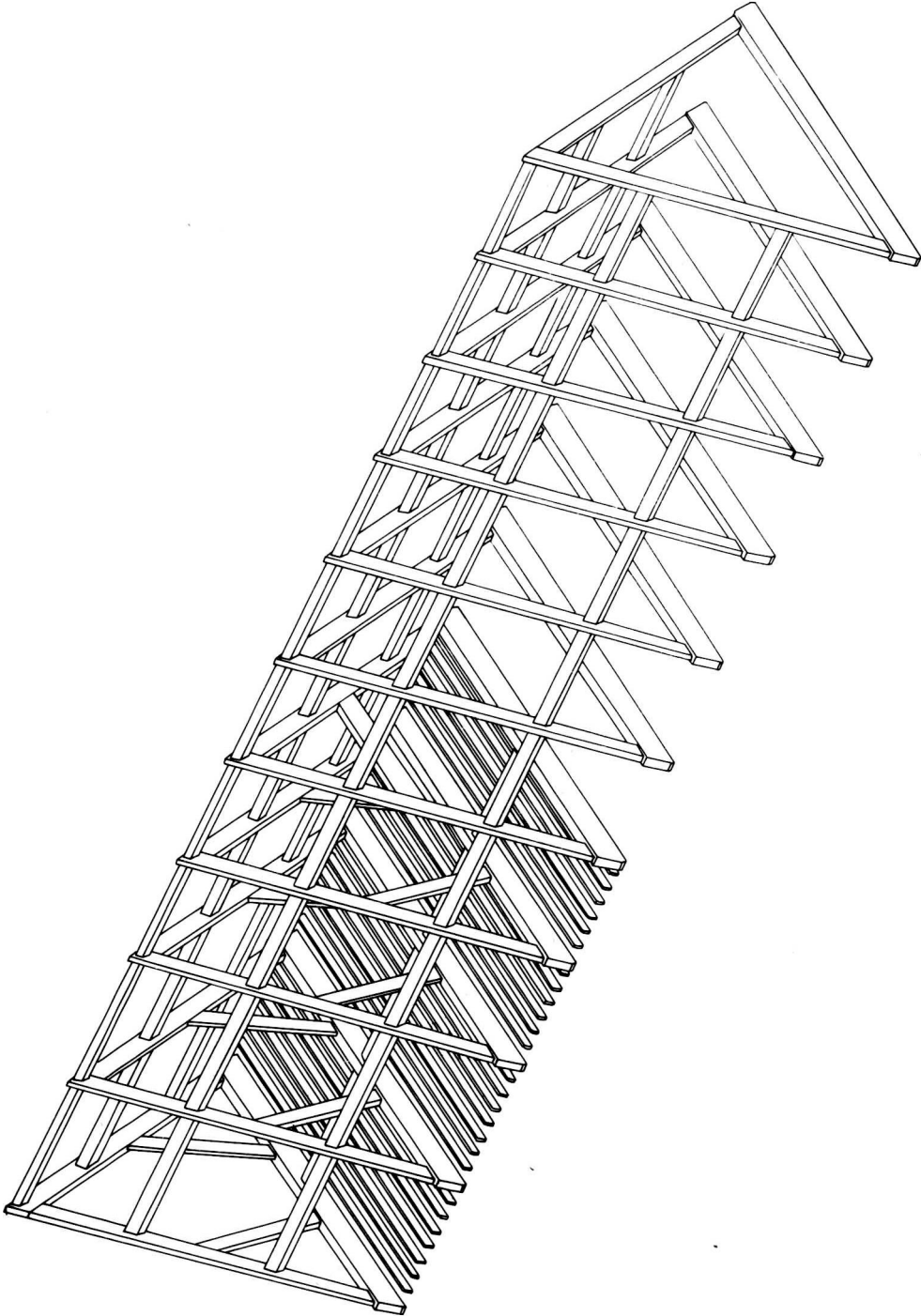


Fig. 14: Isometric reconstruction of phase II of west range roof.

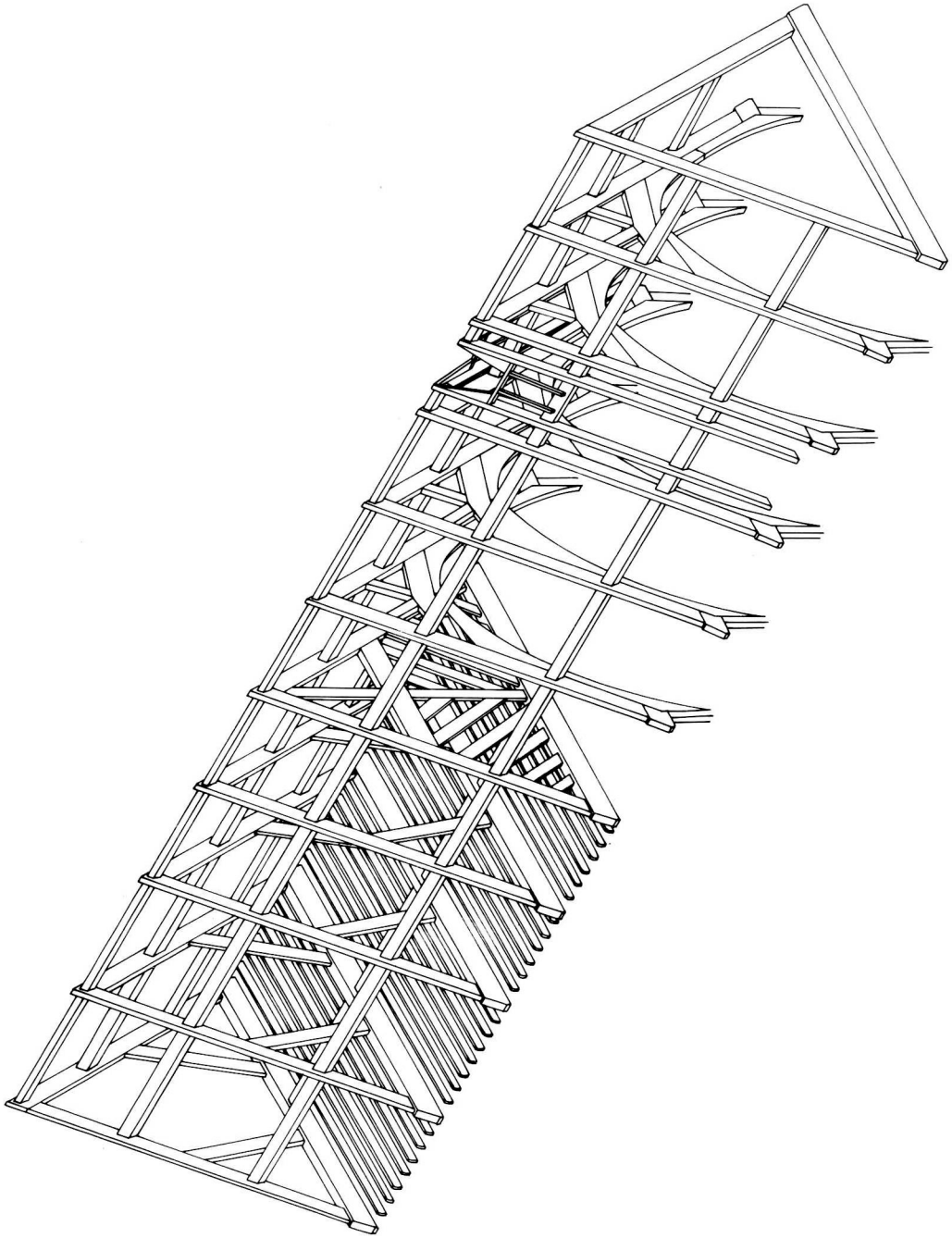


Fig. 15: Isometric reconstruction of phase III of west range roof.

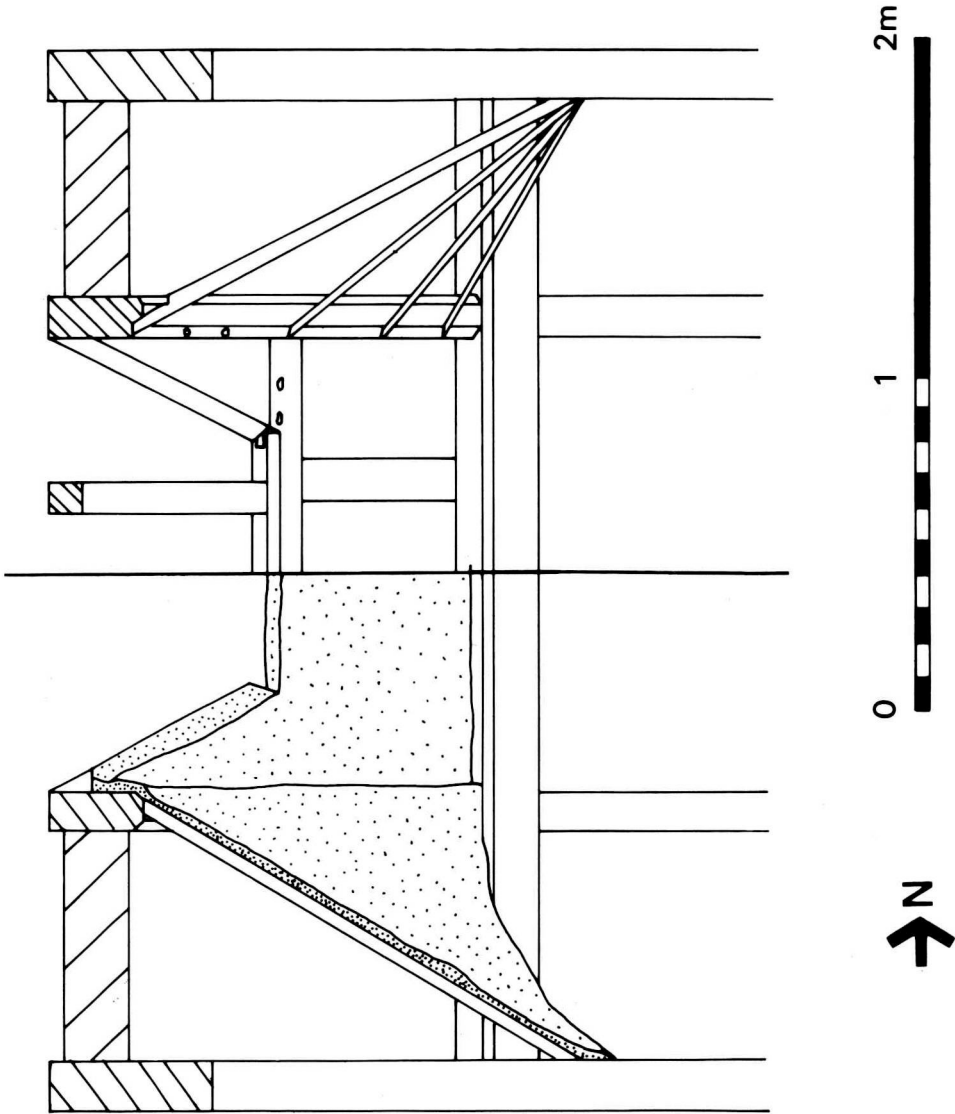


Fig. 16: Half section to show construction of louvre.

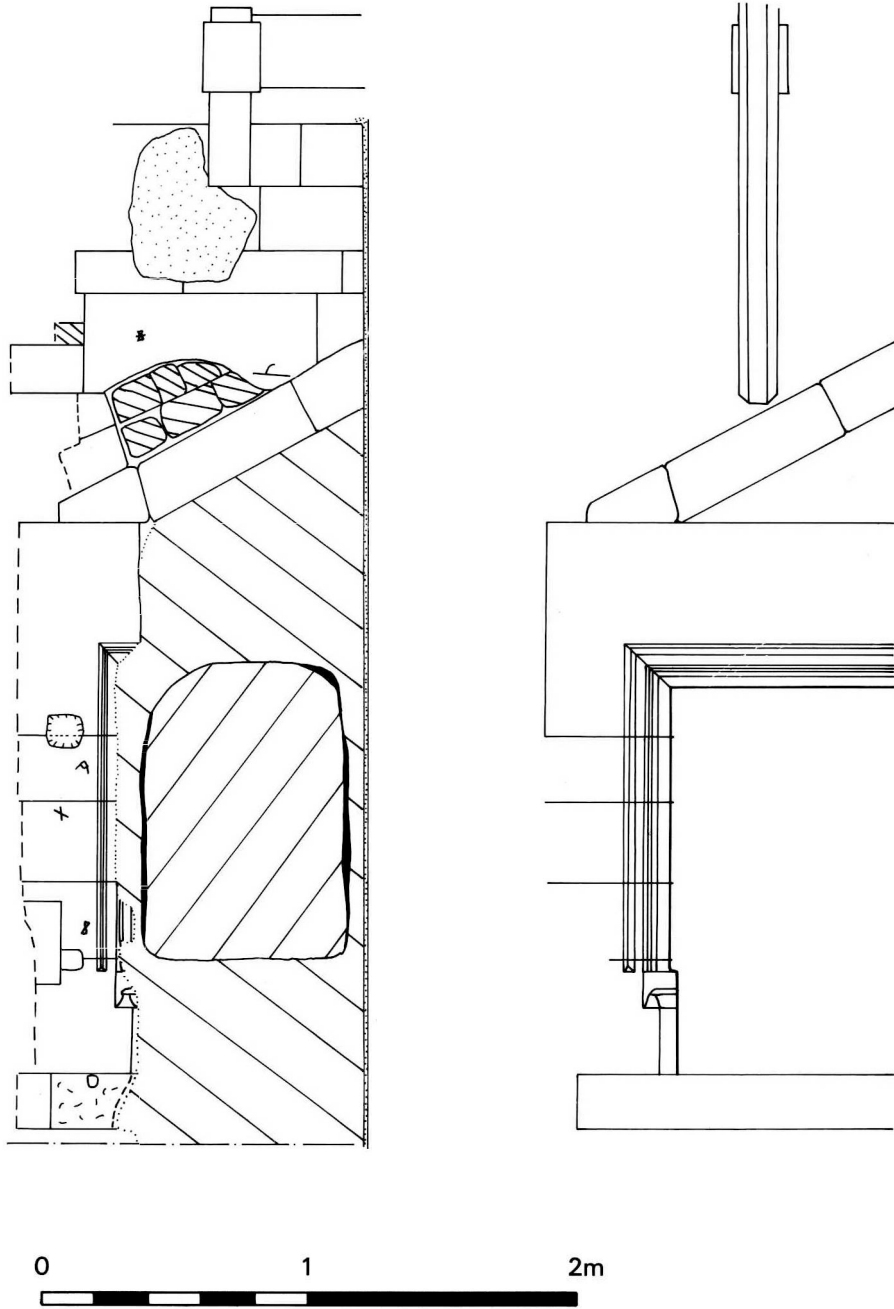


Fig. 17: Part of fireplace, as it survives and as reconstructed.

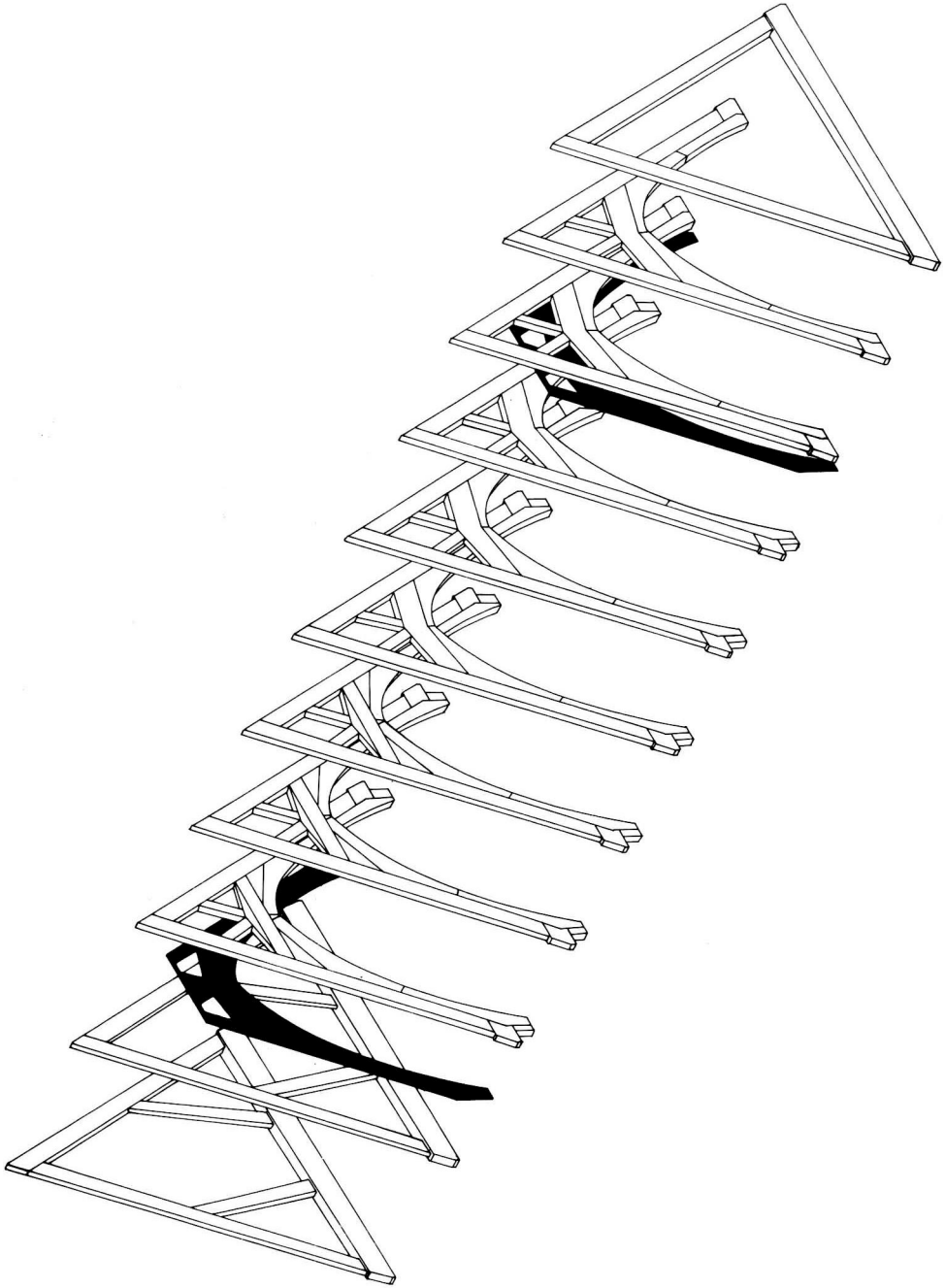


Fig. 18: Isometric reconstruction of phase IV of west range roof.

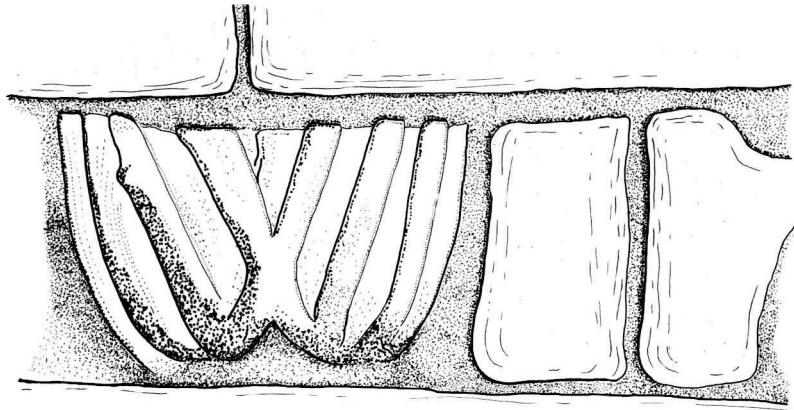


Fig. 19: Reused inscribed stone in west wall of west range.

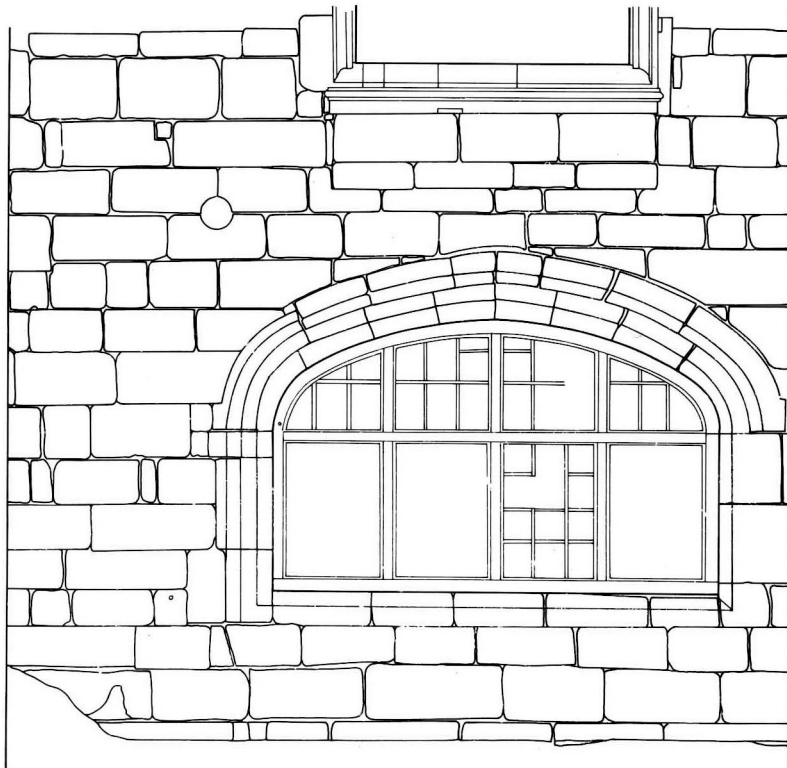


Fig. 20: Detail of probable cloister window in west range.

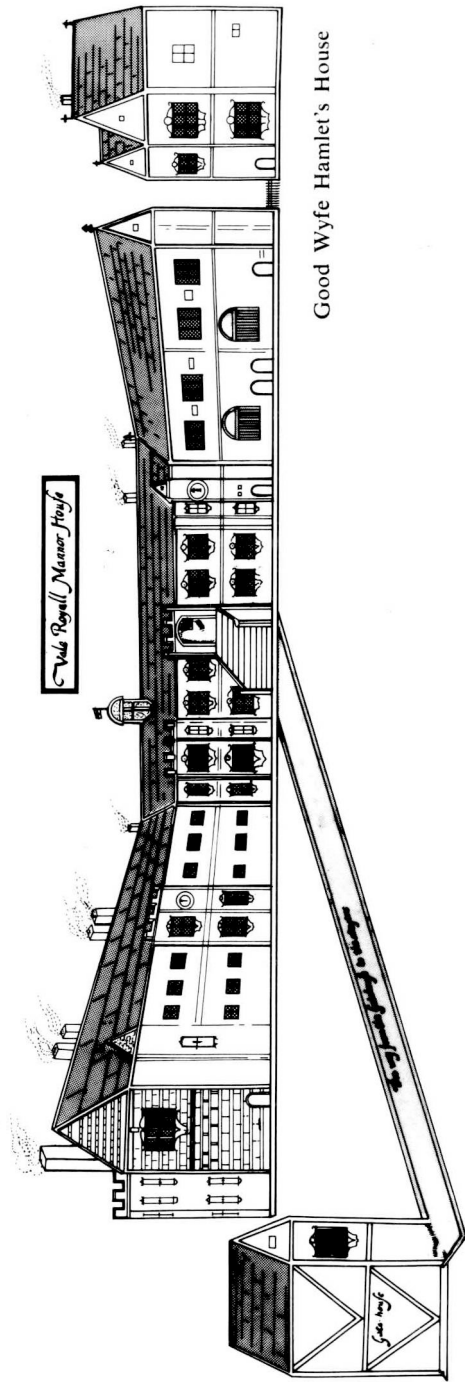


Fig. 21: View of Vale Royal, from estate map reported to date from 1616 (see fig. 28).

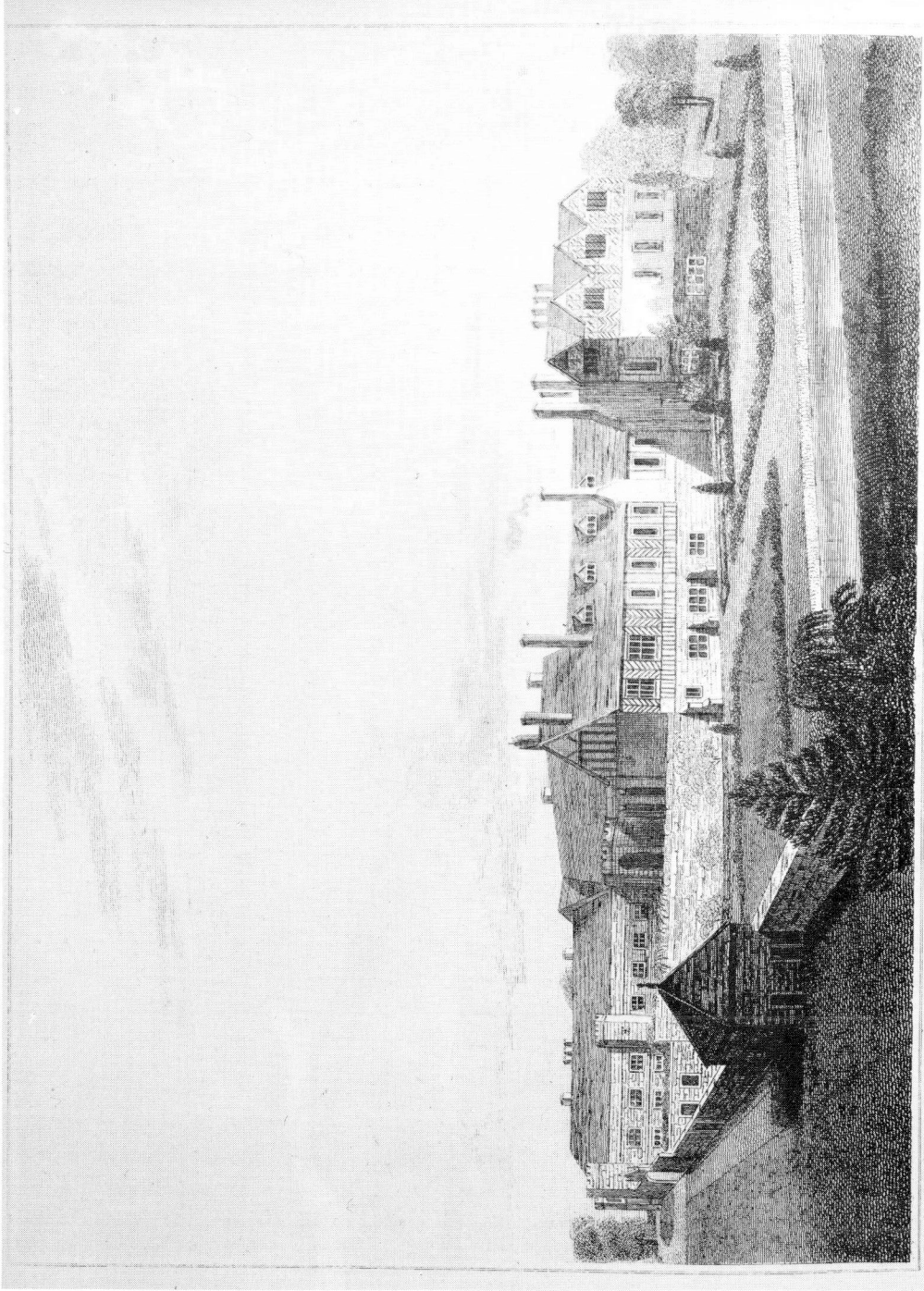


Fig. 22: Vale Royal in 1775: view from south-west
(From an engraving published by G. Ormerod "History of Cheshire", ii [1819] facing page 96).

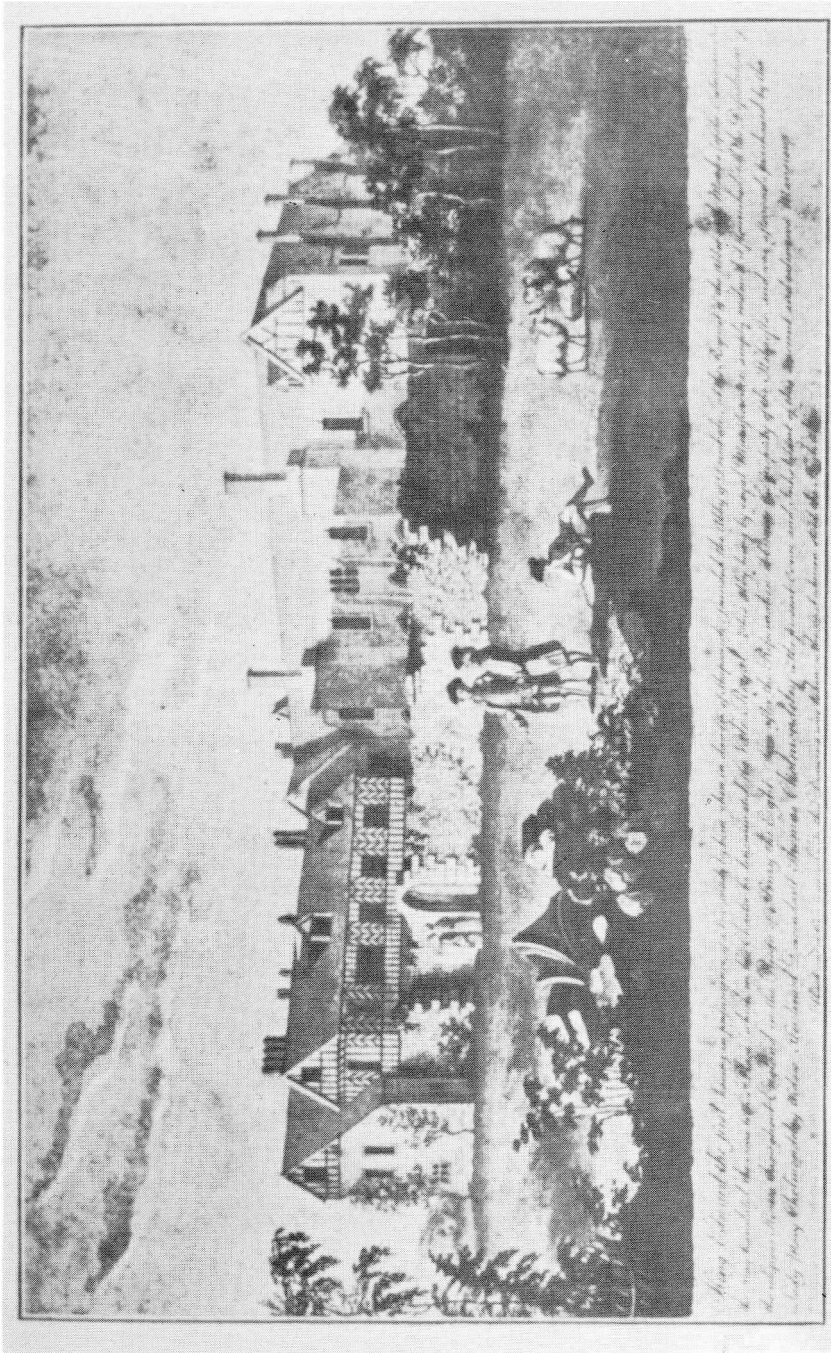


Fig. 23: Vale Royal in 1774; view from north-east.
 (From the "Journal" of the C.A.S., N.S. XIX(2), facing page 209).



Fig. 24: Vale Royal: west front in 1986.

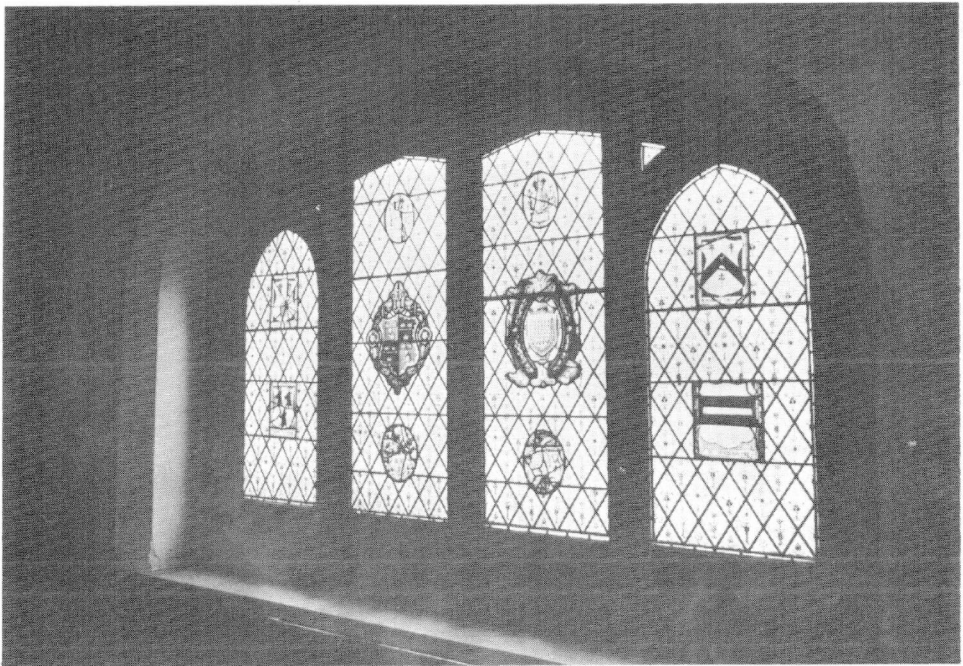


Fig. 25: Armorial glass in window in west range passage.
(Reproduced by kind permission of I.C.I.).

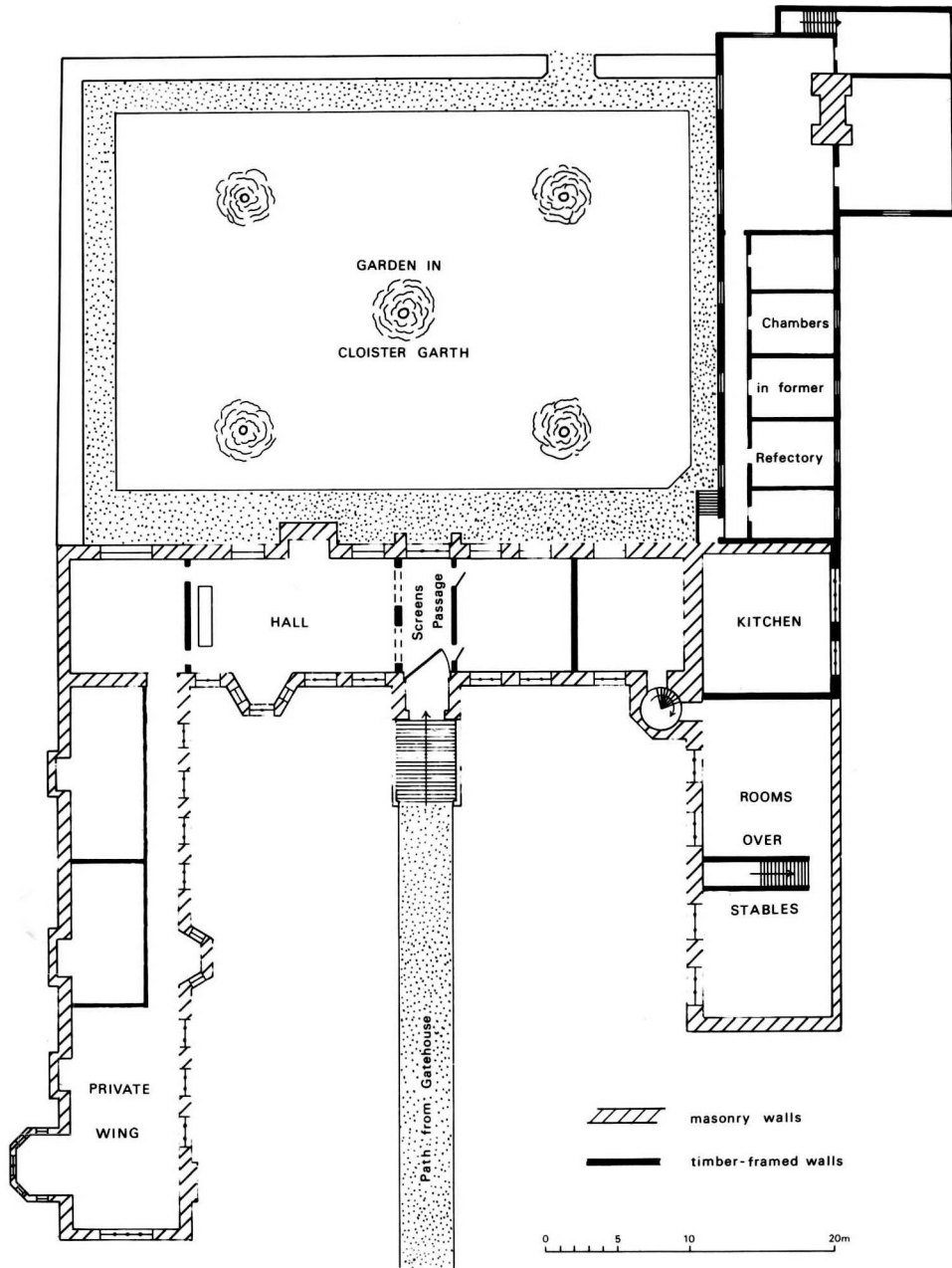


Fig. 26: A suggested plan at first-floor level of post-Dissolution house.

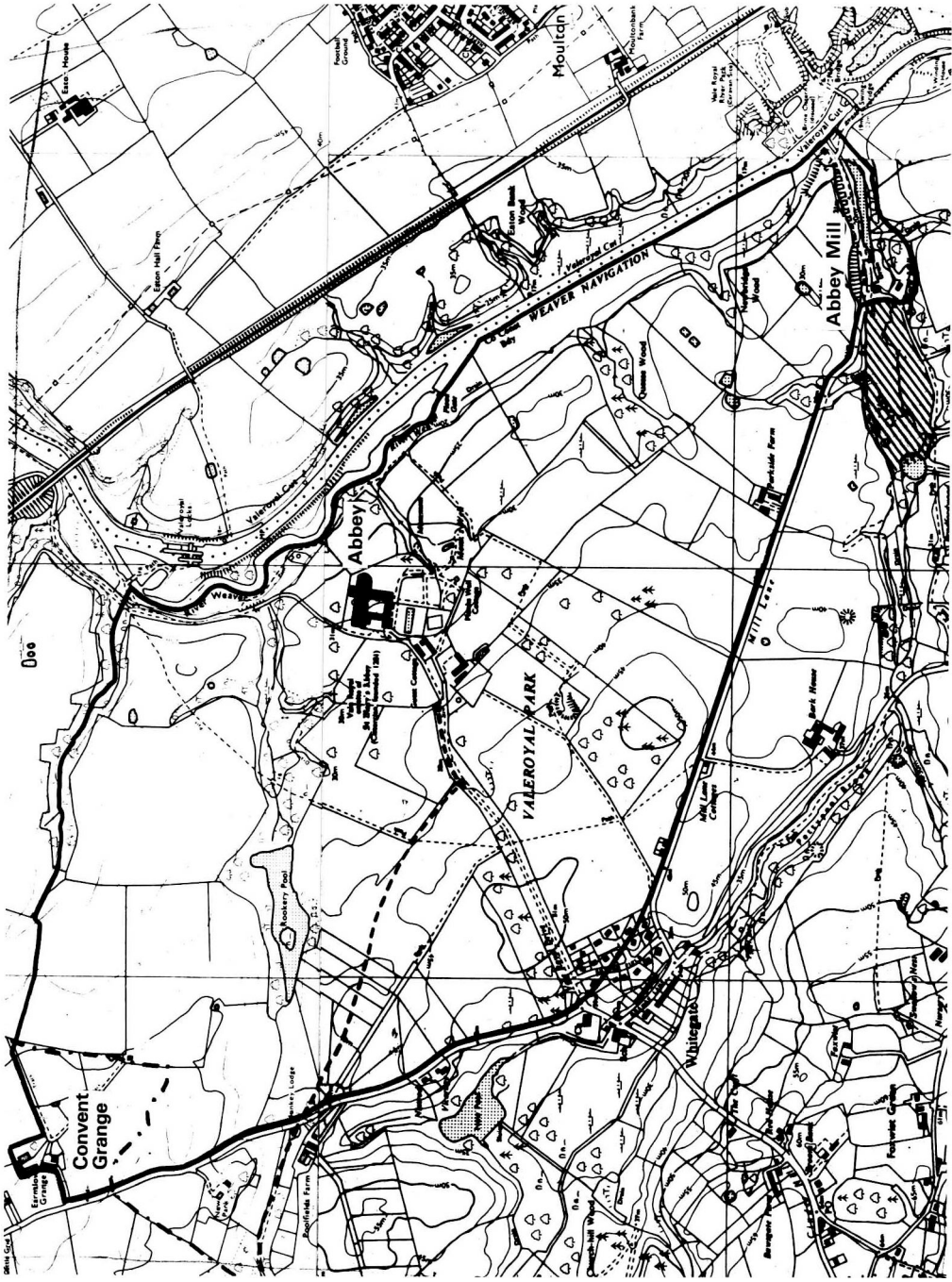


Fig. 27: Suggested boundaries of original abbey estate.

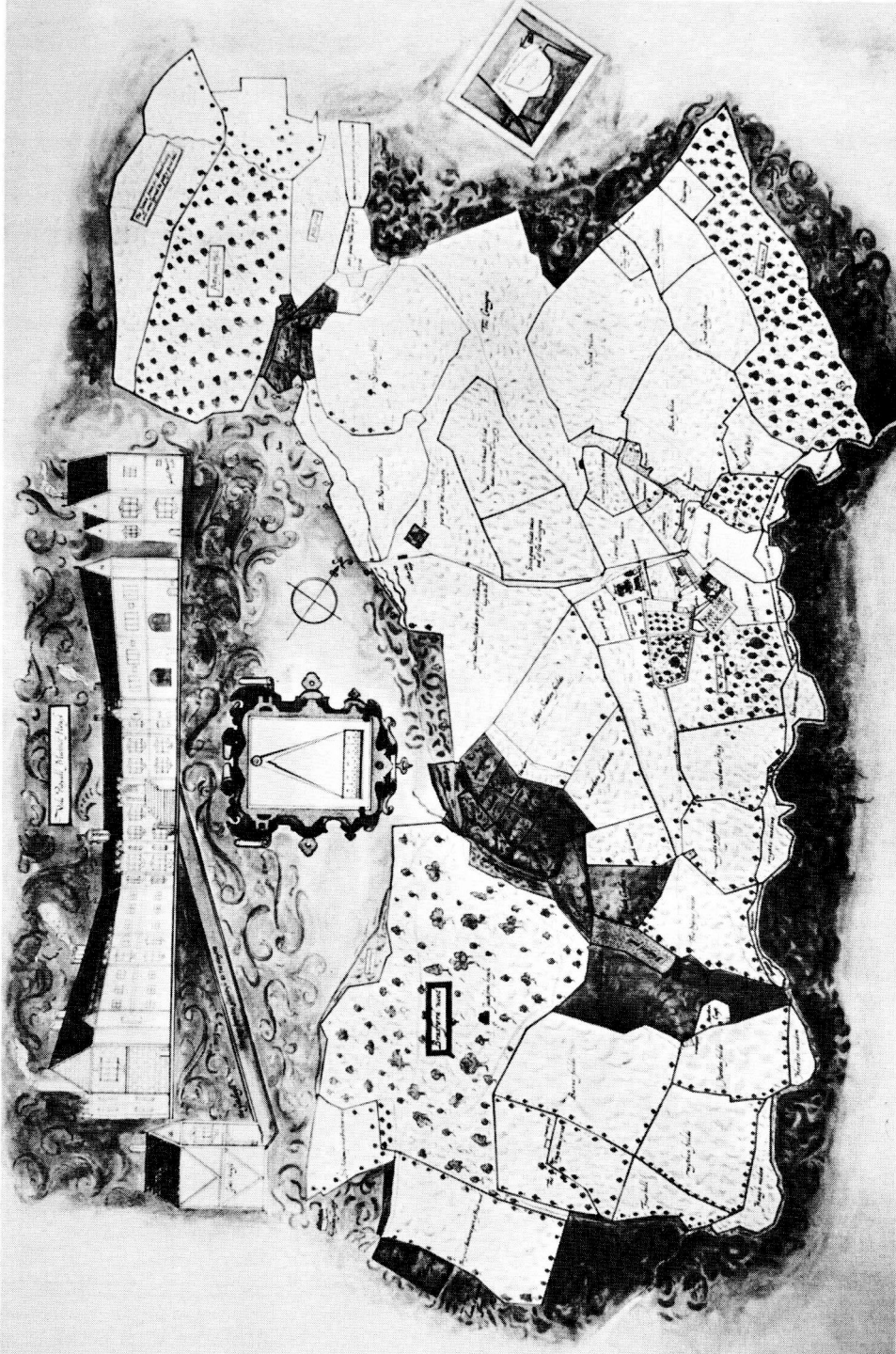


Fig. 28: Early 17th-century estate map of Vale Royal.
(Reproduced by kind permission of I.C.I.)

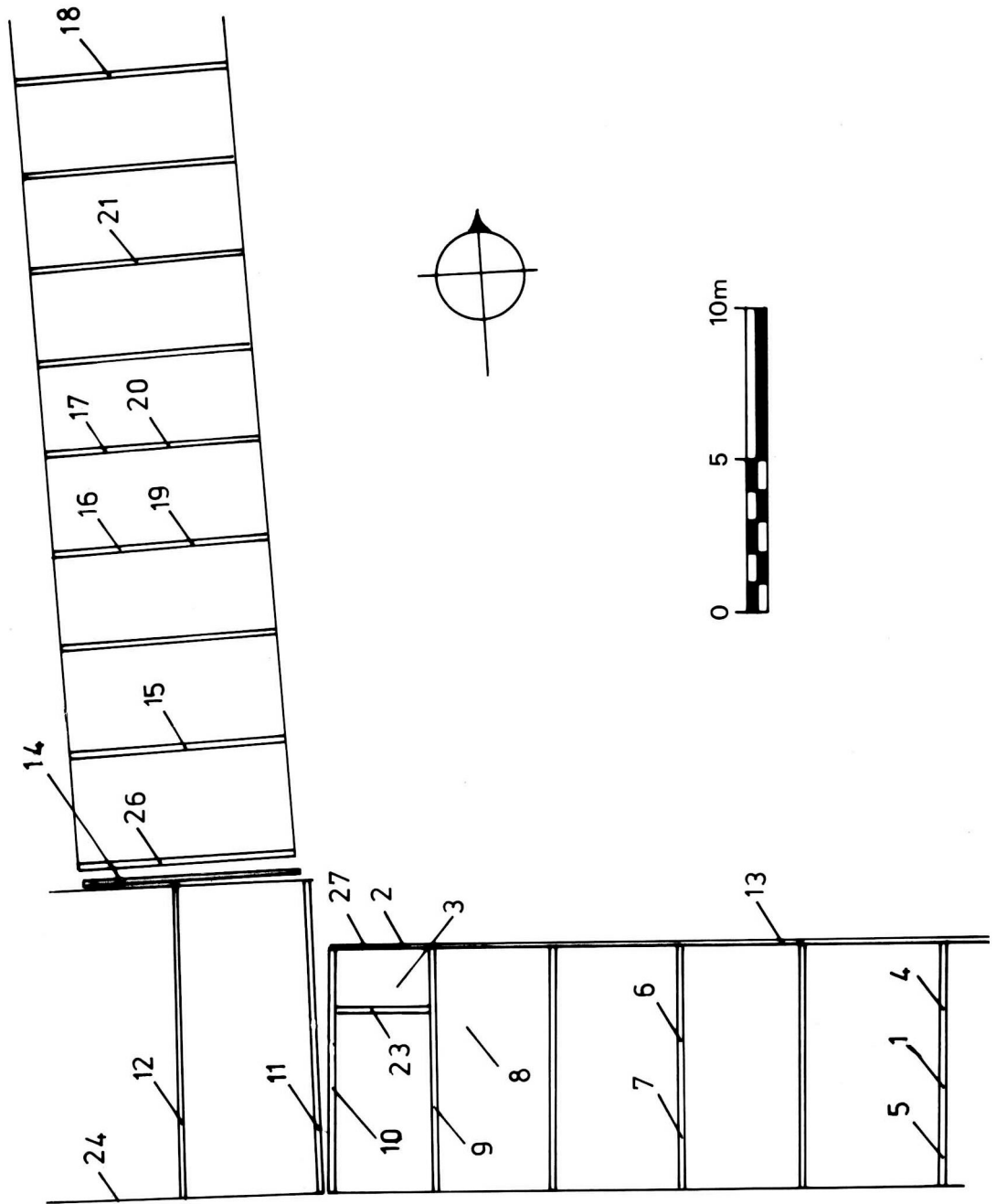


Fig. 29: Position of dendrochronological samples.

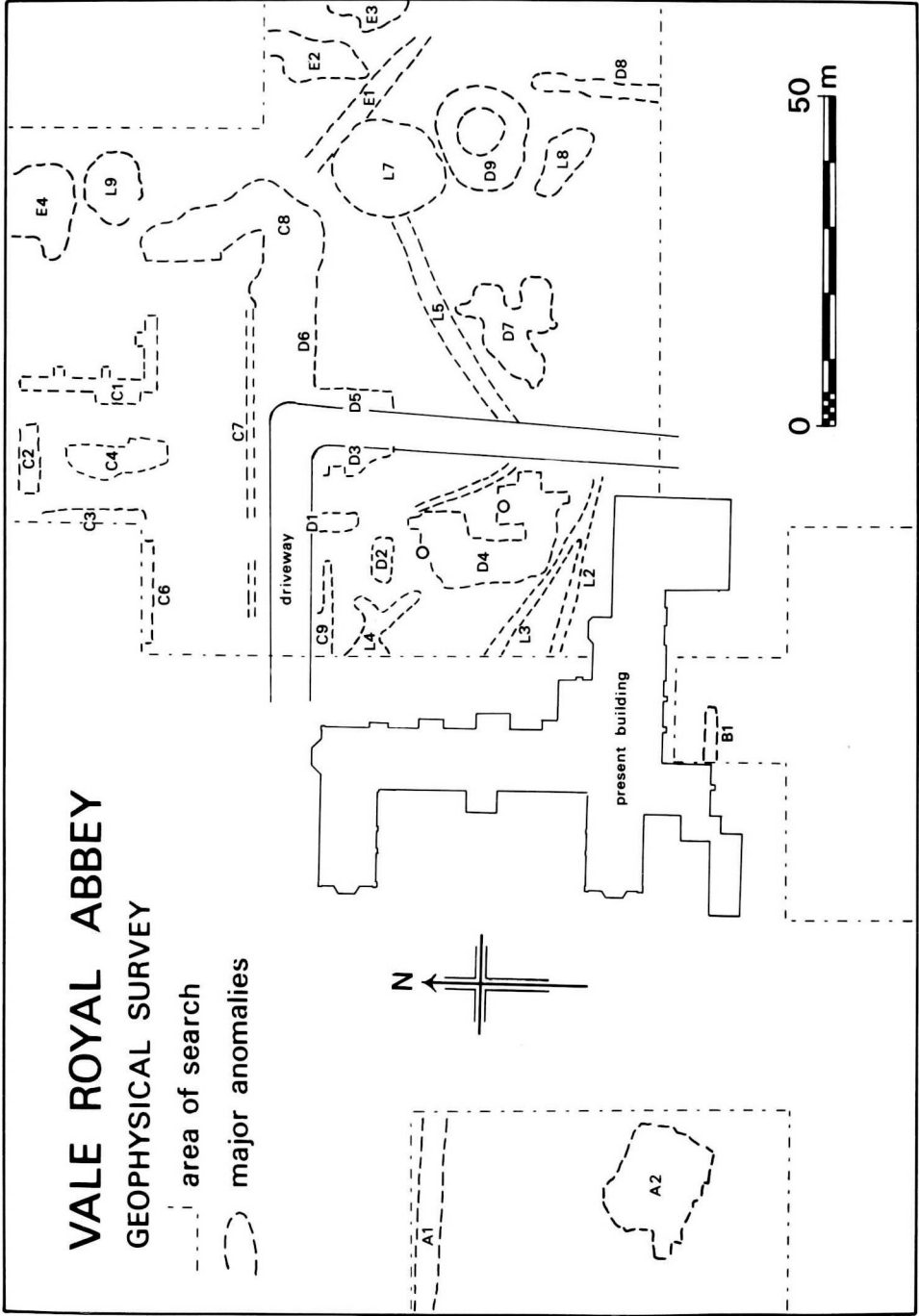


Fig. 30: Plan of the resistivity survey, showing the principal anomalies (after S. Hyatt).

4 m. in width, somewhat larger than the accompanying chimneystack, and parallels are hard to find. Similar smaller examples can be seen in later-15th- and earlier-16th-century houses (Wood, 1965), and locally there are good parallels at Sutton Hall, near Frodsham, a house of c.1500.

Phase IV: The present layout of the rooms on the first floor of this range, and the roof trusses above, came about in 1811 (fig. 18). These changes were described in detail by Henrietta Cholmondeley in a manuscript notebook (Ches.R.O., DBC 1/11), and their effect can be traced in the alterations to the roof trusses. The most dramatic change was the creation of an elegant saloon, central to the first floor. This was made possible by the moving of the entrance at first floor down to the ground floor and demolishing the walls of the screens passage and dias end of the great hall. Two false walls were inserted between trusses 2 and 3, and trusses 8 and 9 to make a seven-bay hall whose two end bays were shorter than the others. In the southern end of the new hall, the tie beams were removed and replaced by arch bracing, this time secured by a combination of through tenons and pegs. To complete the symmetry of the room, the fireplaces had to be moved towards the centre but they still used the existing chimneys. New windows were needed at either end of the screens passage, the remainder of the fenestration apparently being small-paned sashes of the early 18th century. There was a need to match the mullioned and transomed windows of the short wings added to either side of this range in 1796. This work may not have been completed until 1830 when the saloon was 'new sashed with oak casements'. The symmetrical placement of the sashes in the early 18th century did not fit the spacing of the earlier roof trusses, and this is particularly apparent in the armoury roof. Within the saloon, the ceiling was painted with heraldic shields and devices and cusped wind braces added to increase the Gothick effect. The present saloon would appear to have had a later repainting dated 1888, though this number has been altered to read 1868. Since the early 19th century it has been approached from its southern end by a staircase, in late-17th-century style, inserted in the early 19th century but replacing an earlier stone stair.

The library was formed in 1827 'by laying the old drawing room and library together' when the old library ceiling was also pulled down. In 1877, storm damage caused a number of alterations. The oriel window on the east side was added and the panelling, the bookcases and the ornate 17th-century fireplace and door-case were probably all introduced at this time. The door into the north-west wing was described in 1915 by Mary Hopkirk as being 'like a fake bookcase'.

West Range: Ground Floor

The stairs to the saloon rise from a long passage running the whole length of the west range on its eastern side. Other evidence, such as the central position of the stone doorway leading into the monastic kitchen, the width of the passage, and the size and shape of the windows lighting it, suggests that this feature is on

the line and of the form of the west cloister walk. A painting of 1774 (fig. 23) is instructive here. Though the ground storey is obscured by what must be the rear wall of the east cloister walk, just visible over that wall are the tops of four broad pointed windows and at the centre a taller, narrower doorway which may mark a passage through the cellarer's range to an outer court. The four windows presumably lit the cloister. Their date is unknown; one was rebuilt after a storm in 1877, another was blocked in 1820, when the Chintz Rooms were added, and the other two are simply chamfered and bear no evidence of tracery (fig. 20). The four-centred arched openings are equidistant from each other and have a late medieval plinth at ground level. The masonry is confusing and shows numerous repairs and rebuilds. Though there is little left of the monastic structure, and though the present windows are likely belong to a general remodelling of the late 18th or early 19th century, they are almost certainly rebuilt in the position of the original openings of a glazed cloister. It seems, then, that the cloister walks were enclosed within the claustral buildings, an arrangement unusual in rural monasteries, but adopted at several urban friaries and nunneries where there was a shortage of space (not in fact a problem at Vale Royal).

The interior of the ground floor seems to retain no monastic fabric. The plaster vault in the 'cloister' passage is a Gothick pastiche of the early 19th century. It can also be found in the entrance way through the range from the front door. Further alterations were made in 1823 when the porch was built out to buttress the walls, but the heavy studded oak door is almost certainly the original one from the first floor.

SUMMARY OF THE HISTORY OF THE POST-DISSOLUTION HOUSE

Thomas Holcroft came to Vale Road abbey as head of the King's commission of enquiry in 1539. Thomas was one of the Holcrofts of Holcroft Hall, near Culcheth in Lancashire. Baines (1870) describes them as 'traffickers in monastic property'.

Thomas was to become one of Henry VIII's most trusted men in the region and he was later knighted during the king's campaigns in Scotland in 1549 (Ormerod, 1882). One of his rewards would seem to be the purchase of Vale Royal abbey in 1542 with most of its lands, including the granges of Connersley, Bradford, Earnslow and Marton, and Bradford mill and the dam at Petty Pool for a sum of £450 10s. 6d. (Ches.R.O., DBC/26/7). He consolidated his land holdings in the area four years later, by purchase of two former abbey manors, Weaverham and Over, for a further £464 10s. 10d., and in exchange for the manor of Cartmel. Compared with some of the famous monasteries further north, the work of demolition at Vale Royal abbey was very thorough. The instructions to the suppression commissioners were 'to pull down to the ground all the walls of the churches, steeples, cloisters, fraters, dorters, chapter houses with all other

houses, saving them that be necessary for a farmer' (Platt, 1984). Thomas Holcroft followed these orders almost exactly, leaving only the west and south range of the cloisters to be converted into a house and perhaps some ancillary buildings for agricultural purposes. In 1539, he wrote to Henry VIII declaring that he had 'plucked down' the church as ordered (Brown *et al.*, 1963). The materials were sold to raise revenue for the Crown. The lead was taken to London, but the stonework, timber and church fittings must have been sold locally. As Thompson pointed out, Holcroft may have used quantities of timber and stone in altering and extending his own house (see fig. 19). Three other buildings may reuse Vale Royal abbey stone. Sir Hugh Starkey, who purchased Knight's Grange of the Vale Royal property, remodelled the church of St. Chad at Over, in 1543. The style is Perpendicular, except for a reused Decorated window, perhaps from the abbey church (Pevsner and Hubbard, 1971). There is a legend of the Devil moving the abbey church to Over (Cooke, 1912). St. Mary's church, Weaverham also seems to have been completely rebuilt during the second half of the 16th century, and as Holcroft was lord of the manor, again, the stone may have come from Vale Royal. The Mainwaring family bought Marton Grange from Thomas Holcroft and built a new house. Excavation has shown the reuse of a range of architectural fragments in the foundations, presumably from Vale Royal (Curzon, 1974).

Something can still be deduced of Holcroft's work at Vale Royal, especially in the upper storey of the south range, adorned like Norton with chevron decoration; a purlin from an anteroom in that range, which yielded a felling date of 1548, seems to have been hastily prepared for use in the remodelled building. Though timber framing decorated with chevrons makes an early appearance in the gables of Compton Wynyates, Warws., in the early 16th century, its use before 1500 is as yet unproven, and it was only becoming fashionable by the 1550s with its lavish application at houses such as Little Moreton Hall (Pevsner and Hubbard, 1971). Holcroft perhaps inserted decorative chevrons and new windows into the existing frame of a late monastic upper storey, or (though this is less likely) rebuilt at this level while retaining both ground floor and roof. Ormerod (1882) clearly believed that the wing was added by the Holcrofts.

One other example of Holcroft's aggrandisement of his new house survives. Vale Royal formerly had a large selection of armorial stained glass. A little remains in one of the cloister windows (fig. 25), but most of it is now in the Burrell Collection, Glasgow (Wells, 1972). Though some of the glass was brought from other local houses, it is mostly of mid-16th-century date and depicts the arms of knights of the Garter. Perhaps Holcroft aspired to these social levels.

The ranges projecting west from the west front are insufficiently detailed on surviving views to be closely dated. But the use of castellations on the bay windows would seem to link them with Holcroft rather than the abbey. Though their layout can only be guessed at, they have been included on the reconstruction of the plan of Vale Royal in the early 17th century (fig. 26).

The house thus adapted and adorned was probably little altered until the end of the 18th century. James I stayed with Lady Mary Cholmondeley for four days soon after she purchased the property, and hasty alterations (such as the conversion of the refectory) may have been made for his entourage (Nichols, 1828). The introduction of neo-classical elements in the early 18th century was probably the work of Charles Cholmondeley (1684-1756). Analysis of the house is, however, a complex process, heavily dependent on three pictures, which give an indication of the full extent of the building and show some external detail, now lost.

Ormerod's *History of Cheshire* includes a crude asymmetrical drawing of the west front of the house which he dates to 1616 and states was copied from a picture hanging in the house. The original is described by Nichols in his account of the progresses of King James the First:

'A drawing of Vale Royal, taken in the year previous to this visit [i.e. 1616], represents the "Manor House" as it had been new-modelled by its grantees, the Holcrofts. A gateway would admit the Royal party to a spacious court, round three sides of which the mansion displayed its bay windows and oriels, with a broad flight of twenty steps in the centre heading to the ancient refectory of the Abbey, seventy feet in length, still preserved entire, and containing among numerous portraits, those of the "bold Ladie" and her martial husband' (Nichols, 1828).

A copy of this picture is now in the possession of I.C.I. and hangs over the library fireplace at Winnington Hall, Northwich. This has proved a most valuable source of information (fig. 21). The view of the house is much more detailed than that given by Ormerod but neither the plan nor the view of the house is dated. The painting of the house and the estate map may have been commissioned in 1616, just after Lady Mary Cholmondeley purchased the property from Thomas Holcroft's son. The sale document survives (Ches.R.O., DBC 3/6) and dates from 1615. The house is referred to as 'the capital messuage and part of the late dissolved monastery of Vale Royal', and this and the associated buildings, gardens and lands were bought for £9,000. This is a staggering twenty-fold increase in price, which despite the inflation of the Elizabethan period, shows what a bargain favoured commissioners received at the Dissolution.

The house is approached through an insubstantial timber-framed gatehouse, apparently set at right angles to the main view. This leads to a bold flight of external steps and a castellated porch with a shallow arched entrance. The west front has three-light casement windows with lattice leaded glazing. Three bays to the left of the porch is a two storey bay window, lighting the dias end of the hall. At this point on the ridge is a lantern, whose structure has already been described. In the angle with the south-west range is a projecting stair turret with a gable roof and a clock, with only one hand, in the top storey. Just to the left of this is what has been interpreted as a pilaster, and on the existing front of the house there is a pilaster in this position which is of a different style of masonry and

moulding. By this date, the use of giant order pilasters had only been seen at such courtier mansions as Kirby Hall, Northamptonshire. A single pilaster is a nonsense and its apparent presence may be formed by the junction of the stair turret and a rainwater downpipe. The present positions of the chimneys at the rear of this range are not shown.

The north-west range comes forward at least nine bays and is as long as the main range. The print shows cross-windows and at the centre a two-storey castellated bay window similar to that lighting the dias end of the hall, except for a clock in the upper storey. The gable end is detailed with ashlar masonry or just possibly timber framing. A door gives access to the ground floor and an oriel window looks out across the parkland. The north side of the range has three massive lateral chimney stacks, implying at least five heated rooms and at the north-west corner is a projecting turret.

As this wing leads off from behind the dias end of the hall, it must contain the private apartments of the post-Dissolution house. All the fireplaces are to the north, implying a long gallery or corridor along the south side with a line of chambers behind. The range ends in a room with a view to the west and with a castellated projection on the north side. There may be a complementary corridor at ground level with access from the door in the gable end. This range seems to be an addition and it reuses the line of the wall of the south aisle of the abbey church on its north side. At Castle Acre, Norfolk, however, there is a range in a similar position built during the monastic period, which extended the prior's lodging. The reconstruction at Castle Acre (Platt, 1984) shows considerable similarities to Vale Royal, but none of the depictions of Vale Royal show any medieval openings.

The south-west range is of a different character. It is shorter than the north-west range and has plainer mullioned windows at first floor and two large louvred openings and three doors in the ground floor. The range is attached to the monastic kitchen and has no chimneys. It was perhaps stables beneath and storage above. There is also a free-standing building called the 'Good Wyfe Hamlet's House'. It has similar casement windows to the west range and may be another reused monastic structure. On the estate plan, this building or one in its position is called a pigeon house (fig. 28). On the same plan a building opposite the church in Whitegate village is called 'Mr. Hamlet's house'.

It is possible to compare many of the details of this view with a later print dated 1775 (fig. 22). This shows the same view at a more oblique angle. The architectural detail is more realistic. Chimneys have appeared on the rear of the west range and the louvre has gone. The porch remains at first floor but there is no trace of the bay windows. The windows would now seem to be sashes with architraves and prominent keyblocks, one of which still survives on the rear of the west range. No pilasters can be seen, but the view may be too oblique. The stone north-west range can be seen to be an addition to a short cross wing and has three-light mullioned and transomed windows. The range has been slightly reduced from that shown in the earlier drawing, and it has a hipped roof and a second tower

has been built to balance the original bay window. The south-west range has been demolished to form a garden wall, probably following damage, reported as happening during the Civil War, and the gatehouse has been replaced by a screen and archway.

This view shows the south range in some detail. The ground storey is in stone with mullioned and transomed windows. There is no suggestion of medieval openings. The upper storey is timber-framed with chevron decoration including that on the wall of the monastic kitchen. Added to the south-east corner is a three-storey, triple-gabled wing with more highly decorated timber framing with chevrons and lozenges. There is a cluster of chimneys, fitting rather awkwardly onto the building.

The rear of the house is known only from a lost painting of 1774 (fig. 23). This shows the south range with a completely timber-framed upper storey, the detail of which may be reconstructed from surviving portions and from careful analysis of mortice holes in the wall plate (fig. 9). The same picture also shows that the rear of the west range had two massive chimneys and four first-floor windows with stone architraves and keyblocks, one of which survives today. In the centre, flanked by two buttresses, is an older mullioned and transomed window which must have lit the screens passage. The rear view of the north-west range shows lateral chimneys and a projecting stair turret against the eastern gable.

How the front evolved into its present form by 1823 has never been satisfactorily explained (fig. 24). In the *Magna Britannia*, Lysons (1810) states that the short wings were added to the front of the west range in 1796. There must then have been a strong desire to improve the symmetry of the house. The prints offer no certain evidence of pilasters, but Ormerod writing in 1819 mentions 'the pilasters, which, in some previous alterations had been fixed to the wall'. It can, however, be shown that the pilasters on the main range have different masonry and mouldings from those on the short wings. If the earliest pilasters are early-18th-century and contemporary with the insertion of the sash windows, the effect would have been very unbalanced. The porch remained at first floor until the formation of the saloon in 1811 and the long, north-west wing retained its Tudor detailing. The dining room within one of the new short wings also betrays an awareness of architectural history, in having a copy of an ornate classical doorcase and dado in the manner of William Kent.

In 1833 attention was turned to the south range. Edward Blore was called in, and he replaced the timber framing of the triple-gabled wing with brick and stone, to a similar plan and elevation. A design for Vale Royal survives in the Blore Manuscripts in the British Museum (Add.MS. 42028, f.10) but this shows a relatively modest H-plan building, partly timber-framed, which was never executed. Blore had a reputation as a 'cheap architect' (Colvin, 1978, 115) but Henrietta Cholmondeley complained about his heavy charge for the plans of £127 15s. (Ches.R.O., DBC 1/11). A fire in the attics in 1835 led to some rebuilding. The rest of the range was encased by John Douglas in 1860, who also added the

clock tower a year later. None of this work has great distinction but Douglas was a young man and Lord Delamere his first patron. In 1877, the same architect added a pretty porch and balcony window to the west range, which is much more typical of his mature style.

The Cholmondeley family stayed at Vale Royal until 1939 when the house was requisitioned as a sanatorium. Since the Second World War, the house has been used by a number of institutions which has led to a considerable loss of fittings and piecemeal alteration. At the time of writing, the future of the house remains uncertain, but proposals have been put forward to convert it into a hotel, a golf course clubhouse, or flats.

THE ENVIRONS OF THE HOUSE

During the survey work on the house, new information came to light on the development of the land around the abbey and the later house. Though no detailed fieldwork was undertaken, some comments can be made.

The ledger book gives a full transcription of the original grant of land to the abbey which probably remained as the outer precinct through its history, though its holding gradually increased by the addition of adjacent granges (Brownbill, 1914). This grant reads:

‘Moreover the Lord the King ordained the bounds of his same Abbey, in these quadrangular precincts to wit, beginning at that place where the outer gate stands in the Wlods bar of the Abbey and so following along the great ditch so far as the newly built convent grange and the cross standing upon, . . . proceeding as far as the water of Wevere as far as the ditch newly made about the Park, which ditch also takes its rise from the water of Wevere and then following along the ditch around the Park as far as the Abbey Mill, and from the Abbey Mill ascending in a straight line as far as the aforesaid outer gate in the bar where it began.’

This can be reconstructed on the map (fig. 27) as beginning at the present entrance to the drive, going north along Whitegate Road, which runs in a marked hollow way in parts, to Earnslow Grange. A stream in a steep valley form a convenient northern boundary, and the old course of the river Weaver an eastern boundary. The massive overflow and mill pool at Bradford mill must have monastic origins and the course of Mill Lane completes the circuit.

More information about the abbey holdings appears on the estate map of 1616 (fig. 28). The line of the conduit is suggested, running all the way from Petty Pool, a distance of about 2 km. The map states ‘the water came that way in the abbot’s days’, and a small building called the ‘conduit head’ is shown on the drive. This drive runs a little further west than the present drive and the complex of farm buildings shown near the conduit head survives only as a massive spread of brick and stone rubble centred on SJ 636 697. Monastic conduits and drains were well constructed and often continued in use over hundreds of years. It is

possible that the present ornamental pond south of the house, and its overflow which spills out of a stone lion's mouth, near Kitchen Cottage, are still serviced by the abbey's main drain. In front of the house are shown a number of other water features, consisting of a complex of pools, formed by damming a stream at SJ 637 700. This complex can still be seen on the ground. Though the small pits may have begun as clay pits, since there is an artificial dam, it seems likely that they were then maintained as the abbey fishponds.

Around the house, the plan shows a complex of garden, orchards and small wooded parks. This is a valuable record of a 16th- and 17th-century garden, which has been completely swept away. They form at least eight enclosures, some walled, some divided by canals.

The great change in style in park and garden at Vale Royal was not brought about by one of the great landscape gardeners, like Brown, Eames or Repton, but by the Cholmondeleys themselves. A notebook kept by Dorothy Cholmondeley in the 1770's (Ches.R.O., DDX 358/2) records the efforts of her husband, Thomas, and herself, to transform the estate by tree planting. Bushels of seed of the commoner trees were collected and ploughed into prepared plots, a tree nursery was started behind the house and seeds of exotic trees were collected and exchanged with local enthusiasts. They also planted a clump of trees in 1772 around the Nun's Grave, to mark the position of the high altar; a planting which survived until recently.

The grounds were extended by the purchase (in 1814) of the New Park, which is now the Sandiway Golf Club. A drive and an avenue were made from the Round Tower to the Monkey Lodge, and a new drive from there to the house. This work and other improvements were made by John Webb but they have nearly all been swept away, except for a ha-ha which survives as a field boundary 210 m. west of the west front. Significant alterations were made to the gardens early in the 20th century by Mrs. Edith Dempster, whose husband rented Vale Royal for a number of years. A design for this garden of 1915 by L. Rome Guthrie survives (Ches.R.O., DBC 20), as does the badly overgrown woodland garden in the stream gorge running down to the Weaver. Since then the gardens have been divided between three houses and the park has returned to farmland, and few traces of its long history survive.

DENDROCHRONOLOGICAL STUDY by Dr. P. A. Leggett

The architectural investigations at Vale Royal made possible the sampling of timbers for tree-ring dating. The timbers were located in various parts of the building; each timber has its own reference number (Table 1). Since these timbers were to remain in position in the building, cores of wood rather than slices were taken for analysis. The extracted cores of wood had a diameter of approximately 0.9 cm. Twenty-six timbers were sampled in this way, all of which were oak (fig. 29).

The cores were secured by glueing them into grooved wooden strips. They were sanded to a fine polish using successively finer grades of paper, until the growth rings were sufficiently visible for measurement. The measuring system is based on a Bannister incremental measuring machine. The growth rings were measured to 0.01 mm.; the digital output produced was used as input to an Apple microcomputer. Table 1 gives details about eleven of the timber cores extracted. The remaining cores were prepared but not measured since after preparation it became clear that they contained far less than 50 growth rings. Tree-ring series of such short length would have a reduced value in crossdating tests for there are too few rings to get a reliable statistical correlation.

The eleven measured tree-ring series were subjected to visual and statistical crossdating tests using the microcomputer. Crossdating was done by comparing semi-logarithmic, time-series plots of ring widths at all possible positions, and then checking all such positions statistically. Where a unique position of very good fit was found by both methods, the match was accepted (Leggett *et al*, 1978). There was little crossdating between most of the tree-ring series compared. This was not surprising, since the sampled timbers had been selected in the likelihood of them representing different archaeological periods. However, two tree-ring series (LP1301 and LP1304) of fairly short lengths (59 years and 51 years respectively) did show highly significant crossdating between the series, having a Student's 't' value of 6.28 (3.50 is considered significant, i.e. with less than a 1:1000 of occurring by chance) with 50 years overlap. These two tree ring series were averaged to form a mean series called VALM.

The measured tree-ring series were then compared visually and statistically with many dated tree-ring chronologies. These included chronologies from Belfast (Baillie, 1977a), Dublin (Baillie, 1977b), Merseyside, Lancashire and Cheshire (Leggett, unpublished data), Nantwich (Leggett, 1980), Sheffield (Morgan, 1977), south-west Scotland (Baillie, 1977c) and many more. Three timbers including the two that crossdated were absolutely dated against a number of these chronologies (Table 2); Sample LP 1301 spanned the period AD 1391-1449), LP 1304 the period AD 1400-1450 and LP 1305 the period AD 1407-1548.

The timber LP1305 (VR23) is of particular interest since it has retained all of its sapwood and bark completely intact. It is unusual to find a timber that has not been cleaned of its sapwood and particularly of its bark, in a residential building. In an agricultural building this would be a common occurrence but in a building as important as Vale Royal abbey it is most surprising. The presence of any sapwood or traces of the heartwood/sapwood on a timber that has been absolutely dated allows the estimation of the felling date of the tree from which the timber was cut, in the manner described by Hughes *et al* (1981). When bark is also present, the growth ring lying immediately beneath the bark will be the last ring that was formed before the tree was felled. Here, the date of felling is not an estimated one but the true value. Thus, the presence of complete sapwood

and bark on timber VR23 identifies AD1548 as the year in which the tree was felled.

Timber VR23 is a chamfered purlin lying in the anteroom between bays 1 and 2. There was no evidence on the timber to suggest that it has been used in any other position than its present one. This observation with its date of felling of 1548 suggests that this timber was prepared for insertion into Vale Royal abbey after 1548.

Since sapwood was not present on the other two dated timbers LP1301 (VR8) and LP1304 (VR5) their exact felling dates could not be determined. However, observation of the number of rings of complete sapwood in many living oaks, (see Hughes *et al*, 1981) yields a statistical estimate that can be added to the last-formed heartwood ring on a sample to give a date range within which the tree was likely to have been felled. 95% confidence limits are usually given; that is, there is only a 1 in 20 chance of the real date lying outside this range. This results here in later-15th-century felling date ranges of 1468-1499, and 1469-1500 for LP1301 and LP1304 respectively.

In dendrochronological terms, many of the samples from Vale Royal abbey contain relatively few growth rings. The sampling of other timbers from several locations in the building would provide further data from which representative mean chronologies may be constructed. It is well known that a tree-ring series constructed from several timbers is more representative of tree growth in an area than a series from only one timber or a radius from a tree. Studies by Leggett (1980) show that it is possible for even two radii from the same tree not to cross-date because one or both radii contain their own peculiarities. In constructing a mean tree-ring series such peculiarities are eliminated whilst common features which are representative of the site are retained. The individual tree-ring series from Vale Royal abbey will be compared with other dated chronologies, as they become available.

GEOPHYSICAL SURVEY by S. J. Hyatt, B.Sc.

The aim of the survey was to try and establish more of the ground plan of the abbey buildings and to be able to assess how they may have survived. As previous excavations had only concentrated on the church and the history of the abbey was known to be unusual, geophysical survey was the only method likely to increase our knowledge of how the buildings related to the cloister and elsewhere.

The survey was carried out by taking earth resistance measurements on a one-by-one metre grid in units of 20-by-20 metre squares. A twin electrode probe configuration and the Bradphys mark IV earth resistance meter were used throughout. A preliminary dot-density analysis of the results was obtained on site using a micro-computer.

The survey readings are represented graphically in a computer generated dot-density map, in which high resistance values appear dark, while low values appear

TABLE 1
DETAILS OF VALE ROYAL ABBEY TIMBERS

<i>LP Number</i>	<i>Vale Royal Abbey Number</i>	<i>Location</i>	<i>Description</i>	<i>No. Rings</i>	<i>No. Sapwood</i>	<i>Actual Last Year</i>	<i>Terminus</i>
1300	9	S5/6	End wall	81	—		
1301	8	S1	Moulded purlin	59	—	1449	1479
1302	14	S8	Floating truss	76	2		
1303	15	S8(CP2)	2nd truss	121	—		
1304	5	S1(CP6)	Principal rafter/tie beam	51	—	1450	1480
1305	23	S5/6	Purlin	142	22	1548	1548
1306	11	S7	East end wall of false hammer beam	92	—		(in this case the true felling date)
1307	12	S7	False hammer	64	—		
1308	27	Great Hall	Beneath end of tie beam	40	—		
1309	22	S1/2	5th truss in SE range	48	—		
1310	26	Great Hall	Beneath end of tie beam	56	Near heartwood/sapwood boundary		

'Terminus' means the date derived by adding a sapwood estimate to the date of the last ring present; it is an estimate. The date given in the column headed 'Last Year' is not an estimate but the absolute date.

The sapwood estimate used was 30 years; 95% confidence limits for this are 19 and 50 years.

TABLE 2
CROSSDATING RESULTS FOR VALE ROYAL ABBEY TIMBERS

	<i>LP1301 dated as spanning period AD 1391-1449</i>		<i>LP1304 dated as spanning period AD 1400-1450</i>		<i>LP1305 dated as spanning period AD 1407-1548</i>	
	<i>'t' value</i>	<i>years overlap</i>	<i>'t' value</i>	<i>years overlap</i>	<i>'t' value</i>	<i>years overlap</i>
CHRONOLOGY						
Belfast (Baillie, 1977a)	—	—	—	—	5.29	142
South West Scotland (Baillie, 1977c)	—	—	—	—	3.78	142
Euxton House Barn (Leggett, unpublished)	5.64	55	4.91	51	4.08	96
Clayley Hall (Leggett, 1980)	4.80	59	4.98	51	5.02	142
Wales/West Midlands (Siebenlist-Kerner, 1978)	4.10	59	5.19	51	3.85	142
Lydiat Hall (Leggett, unpublished data)	4.93	59	4.21	51	3.54	122
Yorkshire Timbers (Hillam, unpublished data)	3.96	59	4.71	51	—	—
Peel Hall (Leggett, 1980)	4.33	59	4.13	51	4.71	75
British Isles (Baillie & Pilcher pers. comm.)	3.58	59	4.75	51	4.22	142
Mill Street (Leggett, unpublished data)	—	—	3.70	51	—	—
Farington Hall (Leggett, unpublished data)	4.74	55	5.23	51	4.64	96

light allowing the pattern of earth resistance anomalies over the site to be readily seen.

The dot-density map was used to describe the anomaly pattern which is illustrated on fig. 30. Anomalies are referred to by the labels given on the map. These results should be compared with those from the previous excavations outlined on fig. 1.

Area 1, to the west of the present building, shows a comparatively simple anomaly pattern. The linear high resistance anomaly A1 is interpreted as a former drive to the main entrance of the house. This could also be seen as a cropmark whilst surveying. The high resistance anomaly A2 may possibly correspond to the building known as the 'Good Wyfe Hamlet's House' or as a pigeon house. However, the anomaly is poorly resolved, and this interpretation is tentative.

To the south of the building, area 2, shows no coherent anomaly structure. The high resistance anomalies visible occur along the edges of garden paths. The only exception is B1, which may represent a wall fragment. The lack of anomalies is attributable to later landscaping and the masking effects of presently gravelled surfaces.

The main area surveyed, area 3, shows a complex anomaly pattern containing both high and low variation in earth resistance. The pattern is somewhat confused; this is due to the effect of masking by demolition, the high degree of robbing noted in both excavations and an unknown degree of post-monastic alteration to the stratigraphy — particularly in recent times.

Commencing at the northern edge of area 3, a very close correlation can be seen between the anomalies C1, C2, C3 and C4, and the excavated plan of the north transept. C1 shows the eastern wall with its three buttresses, C2 and C3, the other outer walls and C4 the piers of the transept chapels. It is possible that the excavation trenches were refilled with a more homogeneous soil than the surrounding layers, giving good resolution. C5 and C6 seem to coincide with parts of the north wall of the church, while inside the church, a complex pattern of high resistance anomalies is evident, which may have their origins in pier bases, demolition rubble and foundations. The curious, narrow, linear, low anomaly C7 cannot be identified.

At the eastern end of the church, high resistance anomalies were not encountered over the 1958 excavation trenches. The degree of robbing, depth and water content shown in photographs of the trenches in the excavation report (Thompson, 1962) may account for this. A broad high resistance anomaly C8 fills the interior of the eastern end and may relate to or be a combination of surviving flooring, an accumulation of rubble, the foundations of the earlier eastern end or structures belonging to the Nun's Grave standing at its centre. C9 is interpreted as representing a portion of the south wall of the nave, and this appears to have survived as a garden wall until the late 18th century. D1 probably represents part of the west wall of the south transept, which again survived as a garden wall. D2 is unexplained and D3 was caused by upcast gravel from the track.

The large high resistance anomaly D4 is produced at least in part by the large deciduous trees at positions T1 and T2. However it also overlies the cloister walk. D5 and D6 the angle of the south transept. The well-resolved, high anomaly D7 is interpreted as representing part of the chapter house. This suggests the chapter house at Vale Royal may have been larger than usual, comparable perhaps to that at Rievaulx. Because the anomaly does not correspond only with the outer wall, but remains high within the building, it is possible that an encaustic or similar floor may survive.

D8 represents a wall; it is very coherent and unlike the results seen over the church, and is probably more recent in date. The apparently circular D9 may be a monastic structure, though buildings are rare in this position in other abbey plans, but it may also represent a more recent feature, like a garden pavilion. E1 follows the line of a garden path shown on Pendleton's plan and E2, E3 and E4 are not easily interpreted.

Several linear low earth resistance anomalies are apparent, labelled L1-L6. These may represent drains, although whether these are monastic or later is difficult to interpret, or they may prove to be robber trenches. Larger areas of low resistance also occur, such as L7, L8 and L9 for which no conclusion can be reached.

Given the unfavourable factors of the masking effect of a demolition layer, the apparently highly robbed foundations of the monastic buildings (Thompson, 1962), and the effects of more recent gardening and landscaping, a reasonable amount of information is available from the survey results.

To the west of the building, the drive and the possible position of the pigeon house have been identified. In area 3, the most significant anomaly is that interpreted as being produced by the chapter house. Parts of an encaustic tile floor may survive in this building. The plan of the church reconstructed from Pendleton's limited excavations is an overall agreement with the survey results. Trial excavations would be necessary to confirm and date the linear low resistance anomalies as drains and to help identify those other anomalies which did not easily fit into the expected monastic plan. This geophysical survey could form the basis of a programme of selective small-scale excavation to answer many of the questions outstanding at Vale Royal abbey, should the opportunity arise in the future.

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