The history and digital reconstruction of Holt Castle, Denbighshire

By RICK TURNER and CHRIS JONES-JENKINS

INTRODUCTION

Considering how important Holt Castle was in the late Middle Ages, its remains are a disappointment. Found by walking along a footpath running from the village, they stand as a few courses of ashlar red sandstone on a pinnacle of rock within what appears to be a quarry alongside the west bank of the river Dee (Fig. 1). The only surviving architectural feature is a two-centred arched doorway at the end of a flight of steps running down from the inner courtyard and apparently opening into fresh air. The most systematic study of the castle ruins, to date, was published by Lawrence Butler in 1987.[1] He assembled the documentary and pictorial evidence and tried to match them to the physical remains, for which he produced the first modern plan. Building on Alfred Palmer's articles published at the beginning of the twentieth century,[2] he tried to reconcile what appear to be significant discrepancies between the plan and view made of the site, which he considered to have been made in *c.* 1562,[3] with the plan and view produced in 1620.[4] This work left a number of unresolved issues, but Butler's article still provides a very sound basis on which to make a re-evaluation.

Since 1987, some significant new evidence has come to light.

- Documentary evidence for building works at Holt Castle in the last two years of Richard II's reign, which seem to precede his use of the castle as a treasury.
- The publication of a transcription of the very detailed inventory of Holt Castle taken after the arrest of Sir William Stanley in 1495.
- The discovery in the National Library of Wales of a new, large-scale plan of the site from the Duchy of Cornwall records.
- An extended programme of consolidation, archaeological evaluation and geophysical survey of the site led by Steve Grenter, Wrexham County Borough Council, in partnership with members of the Holt Local History Society, which led to the reopening of the interior of the site in July 2015.

It was the availability of this new evidence that encouraged us to attempt a reconstruction of the exterior and interior of Holt Castle, as a three-dimensional digital model (Fig. 2), which was later to be animated. The work was made possible by a generous grant from the Castle Studies Trust, and the work was undertaken in the last quarter of 2014 and the first half of 2015. During this period Wrexham County Borough Council undertook the last phase of their clearance and consolidation of the site, making the courtyard accessible to visitors and enabling them to have a better appreciation of the layout of the original castle.

This paper will begin by setting out the history of Holt Castle and its ownership. It will then consider the different sources of evidence for its appearance and layout, and assess their relative value in the final reconstruction. The reconstructed model is for the date of 1495, as the inventory of the castle taken in that year is the most comprehensive description of the layout of the castle and the function of the spaces that it contained. The pictorial evidence for the appearance of the castle all post-dates 1495, so we consider that

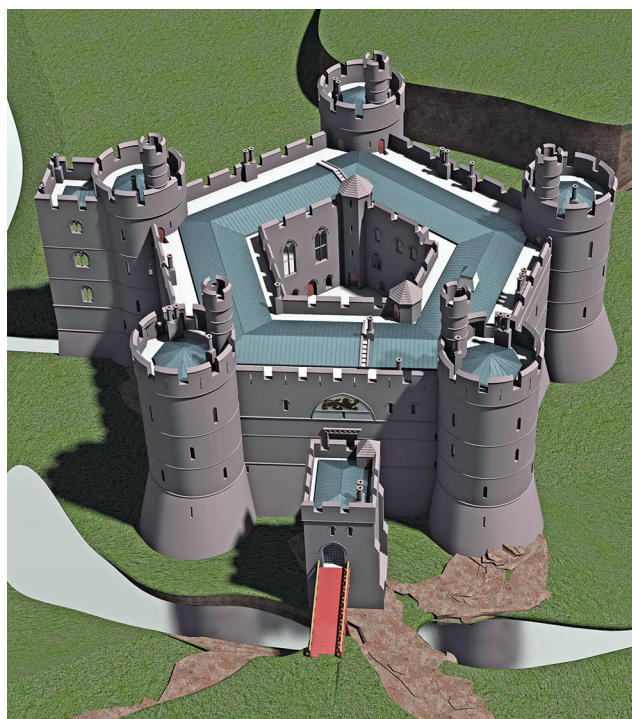Fig. 1. The remains of Holt Castle today. *Photograph: Chris Jones-Jenkins*.

Fig. 2. An external view of the digitally reconstructed Holt Castle from the north. *Digital image: Chris Jones-Jenkins*.

it would be difficult to choose an earlier date for our model without losing its validity. An attempt has been made to make two-dimensional reconstruction paintings of the external appearance of the original Holt Castle.[5] The third part of the paper will describe how the digital model was created and level of certainty we have over the reconstruction of the different parts of the castle. It will also describe the process of generating the animated fly-through of the castle produced from the digital model, work undertaken by Chris Marshall of Mint (Motion Ltd), Cardiff. It is this fly-through that provides the most accessible output from this project.[6] The final part of the paper will try to show how the symmetrical, pentagonal plan of Holt Castle fits into a small group of castles in Britain and elsewhere in western Europe that experimented with geometric plan forms. The designs of this group of castles may go beyond the needs of defence and domestic comfort, and have symbolic and allegorical meanings.

THE HISTORY OF HOLT CASTLE AND ITS OWNERS

The Marcher lordship of Bromfield and Yale was created by Edward I towards the end of his second Welsh war, and was granted to his close friend and political ally, John de Warenne, sixth earl of Surrey (1231–1304), on 7 October 1282.[7] This was one of five new lordships created by the king in north-east Wales at this period, and granted to his magnate allies.[8] The lordship of Bromfield and Yale included an existing stronghold, the Welsh castle of Dinas Brân, just to the east of Llangollen. It was located just inside the boundary of the lordship of Chirk, and its hilltop location made it unsuitable for the development of a new *caput* for Bromfield and Yale. This need was met by the decision to build Holt Castle on what appears to have been a new and undeveloped site, placed close to an important ferry point across the river Dee into Cheshire, later replaced in the fourteenth century by the surviving bridge.[9]

Derrick Pratt has reviewed the evidence for the de Warenne lordship of Bromfield and Yale and for the building of Holt Castle.[10] The earliest mention of a castle at what is now called Holt was in 1311. It refers back three years to a grant of land that came with the requirement for the grantee to provide a mounted man-at-arms at the castle of Chastellion for forty days.[11] So the original castle must have been constructed during the period 1282 to 1308. For the great majority of this period the lord of Bromfield and Yale was John de Warenne, sixth earl of Surrey (d. 1304).[12] His son, William, predeceased him—killed at a tournament—so the lordship was inherited by his grandson, John, seventh earl of Surrey (1286–1347).[13] However, his estates were held by royal custodians until May 1306.[14] This would have allowed the seventh earl very little time to construct such an elaborate castle as Holt from new, suggesting that it was the work of his grandfather, but when remains uncertain. The same problem surrounds the dates and patrons of the construction of the new castles of Chirk and Ruthin, and the substantial additions made to Denbigh and Hawarden Castles after the creation of the other four Marcher lordships in 1282.[15] The design of all these castles is innovative and includes complex, geometrical components or large-scale plans. This suggests an artistic rivalry between their patrons and the possibility that master masons were exchanged from one site to the others.

Throughout the Middle Ages, Holt Castle was referred to as Castrum Leonis, or Chastellion,[16] and for the early Tudor period, the Castle of Lyon.[17] An extent of the lordship of Bromfield and Yale was made in 1315. An extract from the transcribed version reads: 'Firstly there is a certain castle whose precincts are worth nothing per year because the ditches are (in a state of ruin) and no grass grows there'.[18] This can be taken to mean that the castle was in ruin.[19] However, the purpose of the extent was to record the rentable values of the lordship. The ditches at Holt were rock cut, and were (and still are) subject to periodic flooding by the river. Little grass could grow there, so they had no rental value for grazing. The extent also recorded that there was a park of *c.* 100 acres attached to the south side of the castle.[20]

John, seventh earl of Surrey, was mixed up in the political upheavals of Edward II's reign, and was forced to surrender his estates to the king in 1316, who then re-granted them back to him for his lifetime. He then became involved in a personal feud with Thomas, earl of Lancaster, who attacked Warenne's lordship of Bromfield and Yale in June 1318. Warenne was reported to owe Lancaster £50,000, and forfeited his lordship to Thomas in 1319, but escaped payment and received back his lordship after Lancaster's execution in 1322. During Edward III's reign Warenne was a faithful servant, firstly as a soldier in Scotland, and later as one of the keepers of the realm in the king's absence campaigning in France. He had no legitimate heir, and in 1346 the king intervened on behalf of Richard Fitzalan II, third earl of Arundel (*c.* 1313–76).[21] Warenne died on 30 June 1347, and the Black Prince, earl of Chester, stayed at Castrum Leonis between 9 July and 6 August that year, perhaps in the expectation of receiving the castle.[22] His council reported to the prince that the lordship was worth two thousand marks a year.[23]

Fitzalan did not take full possession of his uncle's estates or his titles till the death of his aunt, Joan of Bar, in 1361. He became exceedingly wealthy, but his castles at Reigate, Lewes and Arundel were favoured rather those in the Welsh Marches, such as Holt. At his death in 1376, he left over £60,000 in cash alone, half of which was in the 'high tower of Arundel Castle'.[24] He was succeeded by his son, Richard, fourth earl of Arundel and ninth earl of Surrey (1346–97).[25] Rees Davies comments that this earl lavished attention on two of his castles in the Welsh Marches, Shrawardine, Shropshire and Holt: 'the latter was his premier castle treasury in Wales and stood as a defiant symbol of his power in the area'.[26] An extent of Bromfield and Yale was commissioned along with Arundel's other Marcher lordships in the period 1391–93.[27] This shows that courts were held in front of the outer gate at Holt Castle on a three-weekly basis, with a great court held every six months. The Arundel estates in the Marches raised at least £1,500 net which added to 'the massive sums which his father had hoarded in Holt Castle'.[28] The earl of Arundel was accused by Richard II of staying put with his garrison, in Holt Castle rather than come to the aid of the officials of John of Gaunt's estates during a rebellion by Cheshire men in 1393.[29] Despite this activity, there is no evidence of Arundel spending any money on building works at Holt Castle.

Richard Fitzalan, fourth earl of Arundel, was one of the most powerful and popular men during Richard II's reign from 1377 to 1399. It was his execution for treason that was to thrust Holt Castle into the national limelight. Early in the reign, Fitzalan had provided very effective support to the young king and acted as one of his leading counsellors. However, from 1385, he was to spend the rest of his life in covert or open opposition to the king's will. He became one of the 'Lords Appellant', a group of magnates who wished to curb the king's power through parliament. They took particular exception to the favouritism shown to Robert de Vere, earl of Oxford, by the king. The 'Lords Appellant' defeated de Vere's army at the Battle of Radcot Bridge on 20 December 1387, arrested many of the king's supporters and purged his household. During the 'Merciless Parliament' in February 1388, a number of the king's closest allies were convicted and executed. The appellants remained in control of the kingdom until May 1389. Though pardoned, Arundel was never reconciled with the king.[30]

It was not until July 1397 that the king felt powerful enough to strike back by having Arundel and two of the other 'Lords Appellant', the Duke of Gloucester and the Earl of Warwick, arrested for treason. Arundel was brought to trial on 21 September, during the parliament held in Westminster. Summarily convicted by John of Gaunt and sentenced to be hung, drawn and quartered, the king commuted the sentence to beheading because of his noble birth. Arundel was taken across London by an armed guard of the king's Cheshire men to Tower Hill and was executed. Throughout his trial and prior to his execution, Arundel bore himself with great courage and apparent unconcern.[31]

His head and body were taken away for burial in the Austin Friars Church, Broad Street, London, and rumours circulated that his head and body had miraculously rejoined. Richard II was deeply troubled by these events, and was to suffer nightmares about them for the rest of his life. Arundel's grave began to

attract pilgrims immediately, and after ten days the king sent a group of nobles in the dead of night to exhume the body, check if his head and body had rejoined, and then rebury it in an unmarked place.[32]

Almost immediately after Arundel's execution, the king created the royal principality of Chester, which included the historic county of Cheshire, neighbouring Flintshire and the forfeited Arundel lordships in the adjacent parts of north-east Wales and Shropshire.[33] William Bagot, a deputy justiciar of Chester and close henchman of the king had already been despatched to become constable of Holt Castle and act as steward and surveyor of the Arundel lordships.[34]

Richard II ordered the next parliament to be held in Shrewsbury Abbey church in January 1398, perhaps to re-establish his authority in one of Arundel's power bases. During this parliament, he extended his tyrannical grip over the country.[35] The king stayed at Holt Castle immediately after the parliament closed.[36] By this time the king had a personal bodyguard of 750 Cheshire men, who provided twenty-four hour protection and stood guard outside his bedchamber, armed with great axes, while he slept.[37] Holt Castle, despite its association with Arundel and the memories that this must have triggered, became the most secure place in his kingdom. He was at Holt again on 14 June and for a few days in July 1398.[38] On 29 July 1398, he ordered Robert Kyng, his master mason in Chester, to take skilled masons from outside Cheshire and the lordship of Wales, to work on Holt Castle and gave Kyng the power to imprison 'contrariants'. He gave a similar order to Stephen Wodesham, the king's carpenter to do the same. The order was repeated on 10 November 1398, and gives the numbers as 20 skilled masons and 20 skilled carpenters.[39]

The king may have taken a personal interest in the design and progress of the work, for he was at Holt again on 8 August, when he appointed his uncle, John of Gaunt, as the hereditary constable of the principality of Cheshire.[40] The objective of these building works seems to have been to modify the castle to receive a large part of the king's treasury from London. Over the winter of 1398/9, huge sums of money were salted away there. Periodically, wagon loads of cash were sent up to Holt; 2,000 marks in December and 1,000 marks in February for example, where they were received by John Ikelyngton, the king's treasurer.[41] When Ikelyngton was pardoned in November 1402, it was for receiving £43,964 in cash, along with many precious goods and jewels. In his defence, he said that he had relinquished money and valuables on the oral commands of Richard II delivered in a pre-arranged code, and that he had subsequently delivered the residue safely to London on the orders of Henry IV.[42] The accumulation of this treasure came to a stop after Henry Bolingbroke landed in Yorkshire and moved swiftly through England. He shadowed Richard's return from campaigning in Ireland to Wales, by travelling up the Welsh Marches from Bristol, arriving in Chester on 9 August 1399, from where he immediately despatched troops to Holt.[43]

A French chronicler, Jean Creton, accompanied Richard II on his journey across Wales to Conwy. He reports that Holt Castle stood loftily on a rock, and was 'so strong and sound, that in my opinion, considering the height upon which it is seated, it could not have been taken by force in ten years'. The castle was defended by 100 men-at-arms and carefully provisioned and so was well able to stand a siege, 'But they were not diligent in keeping good guard at the entrance or the pass, which is narrow, and must be ascended on foot, step by step'.[44] However, the garrison surrendered to Henry's troops without a fight. The treasure was reckoned by Creton to include 100,000 marks (£66,667) in gold, besides a great quantity of precious things sent there by the king. There was also artillery and provisions for six years, which also fell into the hands of the rebels.[45]

The lordship of Bromfield and Yale was quickly restored to its rightful heir, Thomas Fitzalan, fifth earl of Arundel (1381–1415) by the now king, Henry IV, in 1400. Thomas was part of Prince Henry's (later Henry V) inner circle, and involved in his campaigns to suppress the Glyndŵr rebellion. In September of 1400, Glyndŵr's forces attacked a number of towns in north-east Wales, including the borough of Holt but the castle was not besieged.[46] After the Battle of Shrewsbury in 1403, Fitzalan was put to guard the Welsh Marches from a base at Oswestry. He granted the burgesses of Holt their new charter in 1411, but

died in 1415 without a legitimate heir, and his extensive estates were divided amongst his three sisters and their husbands. The lordship of Bromfield and Yale was held jointly by Elizabeth, duchess of Norfolk, and Joan, Lady Bergavenny.[47] This joint moiety means it is unlikely that there would have been any significant new work undertaken at Holt Castle during this period. Edward IV intervened when he married his second son, Richard, duke of York (1473–83), to Anne Mowbray, sole heir of John (VII) Mowbray, duke of Norfolk in 1478. Richard would have inherited the Mowbray titles and estates, but given their young age, the marriage could not be consummated and the future Richard III, imprisoned Richard and his elder brother in the Tower of London, where they were murdered in June 1483.[48] The *Calendar of the Close Rolls* includes a succession of references to Bromfield and Yale, and Castle Lyon in 1484. These concern William, earl of Nottingham and Sir John Wyngefeld, a king's knight, who were heirs to the former estates of John Mowbray, duke of Norfolk, and his daughter Anne. By early December, Richard III seems to have secured full possession of the lordship.[49]

Sir William Stanley (*c.* 1435–95) first became involved with Holt Castle in 1467, when he became steward of the lordship of Bromfield and Yale. He held a great court there on behalf of the co-owners, Lord Bergavenny and the Duke of Norfolk into ways of improving the running of this estate.[50] In a violent dispute in the early 1470s between Thomas, Lord Stanley, and the Harrington family over the possession of Hornby Castle, Lancashire, Sir William, Thomas's brother, imprisoned the two Harrington heiresses in Holt Castle as hostages.[51] He became lord of Chirk, adjacent to Bromfield and Yale in 1475.[52] Sir William was to remain faithful to the House of York throughout the Wars of the Roses, and in 1483 he acquiesced to the usurpation of Richard III. Stanley served the new king in suppressing the Duke of Buckingham's rebellion. Following the duke's execution in October of that year, William succeeded him in the post of chief justice of north Wales,[53] and was granted his manor of Thornbury, Gloucestershire. On 10 December 1484, he acquired from the crown, Holt and its lordship, partly by purchase and partly in exchange for the surrender of Thornbury back to the crown.[54] His maternal grandmother was Elizabeth Fitzalan, dowager duchess of Norfolk, so he may have felt that his family should regain this lost estate. In celebration, Sir William Stanley donated the font in Holt parish church, showing the descent of the lordship (Fig. 3).

Holt Castle became Stanley's principal residence, and he was there during Henry Tudor's march across Wales. He ordered the townspeople of Shrewsbury to admit Tudor before setting off with his own army from Holt. Sir William entertained Henry at Lichfield whilst his brother Lord Thomas Stanley kept his forces at a distance. The Stanleys delayed their intervention at the Battle of Bosworth Field on 22 August 1485, but when it came, their impact was crucial to Henry's victory.[55] Different chroniclers credit Sir William with saving the future king's life, of crowning the king on the battlefield, and of being granted the spoils of the field. William retained royal favour, despite not being ennobled, until he was implicated in the Perkin Warbeck plot, and was tried for treason and beheaded on 16 February 1495.[56]

Before his trial, his estates were seized and the king sent three commissioners, Sir Edward Stanley, Sir Edward Pickering and Henry Wyatt to make an inventory of the contents of William's house at Ridley, Cheshire, on 27 January 1495, and his castle at Holt on the following day. Two copies of each of the two inventories survive,[57] and a full transcription has recently been published.[58] The commissioners followed a systematic route through Holt Castle, and this has allowed for an access diagram for the castle to be created, and this will be discussed in more detail later in this article (Fig. 6). To secure the newly-forfeited Bromfield and Yale, Henry VII appointed a number of members of his household as officers of the lordship. During 1495, Morgan Holland was appointed serjeant of peace and 'raglawship'; Robert Nores was given an annual income of £10 from the lordship for his good service; John Pylleston, gentleman usher of the king's chamber became the chief forester; Richard Greenway was appointed auditor of both Bromfield and Yale, and Chirk; and Edward Pykeryng, knight of the body and one of the inventory's commissioners,

Fig. 3. The font donated by Sir William Stanley to Holt parish church. *Photograph: Lee Wilkinson*.

was made chief steward of both lordships, with the power to appoint constables, porters and foresters.[59] Henry VII stayed at Holt Castle on 17 July 1495.[60]

During the sixteenth century, up to the end of the English Civil War and beyond, the castle was part of the Crown Estate. For some of this time, it formed part of the Prince of Wales' estates with the earldom of Chester. The royal stewards were responsible for maximising the value of the property. As a result the castle and its associated lordship were the subject of a number of written surveys, plans and drawings, which will be considered in detail later in this article. Officials continued to be appointed to run and maintain the lordship. One of these was William Brereton (*c.* 1487 × 90–1536), a Cheshire-born groom of the privy chamber, who was made steward of Chirk, and Bromfield and Yale in 1530. At Holt Castle he held 'great porte and solemnities'.[61] However, through the machinations of Thomas Cromwell, he was falsely accused of committing adultery with Anne Boleyn in May 1536, and was tried and beheaded.[62] Holt Castle was still considered important enough to be depicted on the well-known, royal, manuscript map of Britain and Ireland, the *Angliae Figura*, dated to *c.* 1534–46.[63]

Holt Castle was described during Elizabeth's reign by Thomas Churchyard in his famous poem 'The Worthines of Wales' first printed in 1587. He wrote:

Holt Castle should, from verse receive some grace;
The seate is fine, and trimly buylt about,
With lodgings fayre, and goodly roums throughout,
Strong vaults and caves, and many an old device,
That in our daies, are held of worthie price.[64]

Over the next hundred years, the story of Holt Castle is one of decline, siege and dismantling. During the English Civil War, Holt Castle was a stronghold for the Royalist cause. It was briefly besieged by Parliamentary forces between 9 and 18 November 1643, before being relieved by troops newly landed from Ireland. In the opening months of 1645, the towns of Holt and Wrexham both changed hands several times. By the end of 1645, the Parliamentarians had secured Holt Bridge. Holt Castle under the command of Sir Richard Lloyd, Charles I's attorney-general, underwent an extended siege or blockade for most of 1646.[65] One parliamentary commander wrote that 'Holt hath been besieged ever since the taking of Chester. It is a very strong place. Starving is the only way that we can use against that place'.[66] The castle eventually surrendered on terms on 13 January 1647.[67]

After the Civil War, Holt Castle seems to have been abandoned. Between 1675 and 1683, much of the castle walls were dismantled and barged down the river Dee to provide stone for the building of Sir Thomas Grosvenor's new Eaton Hall near Chester.[68] This work was not as comprehensive as it appears today because the Buck Brothers view of the castle published in 1742 shows standing fabric from at least two of the towers. One of the bases of the courtyard staircases has an inscription reading 'BUILT 18[ ]1' suggesting that some repairs were undertaken in the nineteenth century. Until recently a ramp of rock and earth allowed access onto the top of the site suggesting that it was still used as a viewpoint into modern times.

THE STANDING AND ARCHAEOLOGICAL REMAINS OF HOLT CASTLE

The most direct evidence for the appearance and layout of Holt Castle comes from a full understanding of the physical remains. As part of their planned conservation work, Wrexham County Borough Council commissioned a modern topographical survey of the 'quarry' and the pinnacle of rock on which the standing fabric survives. This data can be converted into a terrain model which can incorporate data from other sources. In addition to the topographical survey, a photogrammetric survey of each face of the pinnacle was produced, which can be pieced together to form a record of the standing fabric of the castle.[69] At this stage not all the vegetation cover had been cleared and some additional details were added from hand survey.

Looking in detail at the fabric on site there was a slow realisation of what it represented. There is a marked changed in level between the base of the ashlar masonry of the different ranges. In navigating around the site it is best to use the towers as reference points. Starting at the right of the entrance gate and going anti-clockwise, the names can be modernized from those given in the 1495 inventory as the Glazier's Tower, the Goldsmith's Tower, Another Tower, the Chapel Tower and the Kitchen Tower. For ease of reference these will be called T1, T2, T3, T4 and T5 respectively (Fig. 4). The floors of the ranges between T1 and T2, and T2 and T3 are about 1.2m higher than the floors of the ranges between T3 and T4, and T4 and T5. Inside of the position of T3 is the stub of a stone party wall, containing a large square drain. This marks the position of the change in level (Fig. 1). Clockwise from this point the walls are of sub-basements with direct access and lighting from the courtyard. Going anticlockwise the rooms are full basements with the sockets for three ceiling beams visible between T3 and T4. These rooms were entered from the intramural passageway down from the courtyard opening through the surviving two-centred arched doorway (Fig. 1). The floor levels must have been reconciled behind T5, but all this area of the fabric has fallen away. The other realisation was that the base of the ashlar walling was the floor level in each of the basements with the floors being made of the bedrock. This was confirmed when at the end of the project the basement room to the east of the entrance was cleared and part of the rock floor with two drains was revealed. Minor changes in floor level were likely to be significant in indicating where ranges were divided by internal partitions.

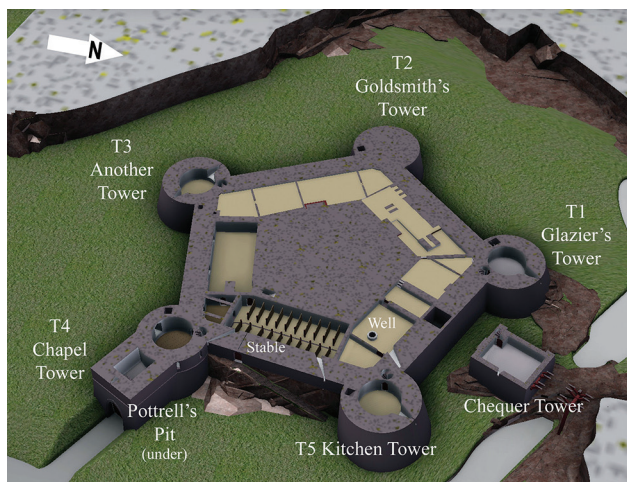Fig. 4. The plan of the basement level taken from the digital model. *Digital image: Chris Jones-Jenkins.*

Fig. 5. Photograph of the base of the T5 Kitchen Tower revealed in the excavations of 2014.
Photograph: Steve Grenter, © Wrexham Museum and Archives.

At the ends of the range between T1 and T2, the corners were made of fine ashlar and showed no evidence for any type of partition in these locations. The solid masonry partition wall with its square drain behind T3 has been noted above, and there are the remains of a door jamb on the corner behind T4. Traces of doorways were also visible beneath the line of the main gate, showing that there was access under the entranceway. All these details allowed for the basement level of the model to be reconstructed with some confidence, and they also provide ways of checking what was depicted on the historic plans described above.

Archaeological excavation was undertaken at Holt Castle over four seasons from 2102 to 2015. Trenches were dug across the internal courtyard, across the site of T1 and the base of the Chequer Tower, across T5, and across the channel and rectangular projection from T4. The locations of the trenches over the towers was determined by overlaying the Duchy of Cornwall plan onto a vertical air photograph of the site, and then using this as a predictive model. This paper is not the place to report on the detailed results of these excavations.[70] What the results confirmed is that the foundation levels of the five corner towers, the Chequer Tower, and the main ranges of the castle, were made by cutting down the plan of the castle from the original ground surface. In the case of T1 and the Chequer Tower, only the cut bedrock survived. The trench across the edge of T5 revealed bedrock treated in the same way. However, its outer face had been tooled and three courses of ashlar masonry were applied to this face (Fig. 5). This confirmed that the bases of the corner towers were flared. Another trench confirmed the line of the channel to T4 though any revetment walls it may have had had been robbed away.

This archaeological information was important in preparing the three-dimensional model, but it had its limitations. The locations of the trenches and the structures they contained were not surveyed to the same level of accuracy as the large-scale topographical survey. Secondly, it was never clear at what level the flared bases were recorded, or in the case of T5 what the angle of the flare was. A judgement had to be made to allow this data to be incorporated into the construction of the model. The excavations in the courtyard did produce areas of cobbled surface, but these were considered to be post-medieval in date, with the original surface at a lower level. Most of the courtyard was heavily disturbed by modern pits, perhaps dug by treasure hunters hoping for some of Richard II's gold. In November 2014, the rooms below the main gate were cleared under archaeological supervision, revealing previously unseen details of the eastern room. Part of one of the side walls of the Chequer Tower was also revealed. By this stage, the three-dimensional model was in its final stages. It was reassuring to find that the details we had reconstructed were matched by the remains revealed on site.

THE PRINCIPAL DOCUMENTARY EVIDENCE FOR THE APPEARANCE AND LAYOUT OF HOLT CASTLE

There are six documents or groups of documents that provide evidence for the now lost parts of Holt Castle. These sources are described in some detail because it proved necessary to reconcile the information that they contain so that they could be used in the construction of the digital model of the castle. Unlike Palmer and Butler before us we needed to decide what information we could rely on and what had to be discarded as misleading. It became apparent that no single document could be taken as completely reliable and so choices were made along the way. The physical evidence of the visible remains of the building and the details of the dismantled structures found in the archaeological excavations provided absolutes against which each documentary source's description of the basement and internal courtyard could be tested. The benefit of using a digital model is that solutions to problems could be quickly reached by testing the consequences of adopting one source of information against another, and seeing which gave the best fit.

The inventory of Sir William Stanley's Holt Castle

Sir William Stanley became the lord of Holt Castle in late 1484. In the ten years he had possession of the site, he may have made some modifications or additions, but by the time that the inventory was taken after his arrest for treason, the castle was fully stocked with furniture, fittings and a substantial store of valuables.[71]

The three commissioners engaged to undertake the inventory of Holt Castle on 28 January 1495, followed a systematic route around the building, moving from inside the outer court, across the bridge and into the 'Chequer Toure', the freestanding barbican tower on the moat. The main castle was entered through the 'Secunde gate' within the curtain wall of the castle. It is possible to reconstruct the layout of the castle from the inventory as a block access diagram (Fig. 6).[72] This diagram will be used later to compare with the sixteenth- and seventeenth-century surveys, plans and views, and to reconcile the apparent disparities between these documents.

The route taken by the commissioners involved them in turning right on entering the 'Secunde gate'. They seem to have entered each range and climbed to the upper storey of the courtyard buildings—presumably by the courtyard spiral staircases—and then descended to the lower and any subterranean parts of these ranges. They then entered the adjacent tower, again climbing to the top and recording the contents in each room as they descended to the basement level. Each tower is named in sequence: the 'Glasiers Toure', the 'goldsmyths Tours', a 'nother Toure', the 'Chapell Toure', and a 'Toure Callid the kechin Toure'. In this paper these towers are referred to as T1, T2, T3, T4 and T5 respectively (Fig. 4). Many of the rooms were also named. Those of high status include: the 'upper Chambre which is for Straungers', a 'Chambre for gentilwomen', the 'Constables Chambre', 'my lades Chambre', the 'high wardrop', the 'Treserhouse', a 'Closet with a Countyngboorde', the 'Chapell', the Stewardes Chambre', and the 'halle'. There are a large number of unspecified chambers including three 'great Chambres'. The locations of two of these great chambers show that one was for the use of Sir William and another for his wife, Elizabeth. The numbers of beds and the quality of the textiles allows the relative importance of the other chambers to be assessed, with the upper chambers in the towers usually being of higher quality to those below.

The remaining rooms divide into two types, those concerned with the storage, preparation and serving of food and drink, and those involved in the storage of other goods, including stables for horses and dungeons for prisoners. All these rooms are shown on the access diagram, using modernized versions of their names (Fig. 6). The rooms have been colour-coded into five different types:

1. The private suite of Sir William Stanley.
2. The private suite of Lady Elizabeth Stanley.
3. Rooms used by other members of the upper household and guests.
4. Rooms for the storage, preparation and service of food and drink, and for the servants responsible.
5. Rooms used by the lower household, for storage and as stables and dungeons.

What this analysis shows is that there was probably a continuous, rock-cut basement storey running around the foot of the visible remains of the castle (Fig. 4). How far these rooms interconnected is not clear from the inventory except that the commissioners do seem to have gone into the basement of each tower and back up again, and then down into the basements of each courtyard range. In addition there must have been access into the stables from the moat. In the base of the T4 Chapel Tower, there was a special room, known as 'Pottrell's Pitte', sunk one storey below the main basement level.[73] On the post-medieval plans, to be discussed later, there was a rectangular projection added to T4, which seems to have included a watergate containing 'Pottrell's Pitte', but no additional rooms at a higher level in this tower were referred to in the inventory.

Fig. 6. An access diagram to Sir William Stanley's Holt Castle. *Drawing: Pete Lawrence after Rick Turner,* © *Crown copyright, Cadw 2016.*

Fig. 7. The plan of the ground floor or courtyard level from the digital model.

Fig. 8. The first-floor plan as reconstructed in the digital model.

Fig. 9. The second-floor plan as reconstructed in the digital model. *Digital images: Chris Jones-Jenkins*.

Access into the ground- and first-floor levels was from the inner courtyard. Lady Elizabeth Stanley's suite was at ground floor, as was the Steward's Chamber and the Low Wardrobe, whose extensive contents he would have had responsibility for. The chamber in the ground floor of the T1 Glazier's Tower had a bed with lavish furnishings and a pallet bed for a personal servant, suggesting that it was intended for someone of importance. Otherwise, the rooms at ground floor had functional uses (Fig. 7).

The first floor contained the principal accommodation for the lord of Bromfield and Yale, and rooms for entertaining his senior household and guests (Fig. 8). It was focused on the hall, which lay between T4 and T5. It would have been entered from its low end, which was alongside the pantry and ewery, with the buttery immediately below. These rooms were placed to facilitate service at meal times. Food seems to have been brought across the courtyard from the kitchen which took up the whole of the range between the T1 and T2, and up the courtyard stairs into the low end of the hall. From the high end of the hall, there was direct access into the great chamber filling the first floor of the range between the T3 and T4. This room controlled access into a small closet acting as a counting house and office and the chapel. At the other end of the great chamber was the only access into the Treasure House and up into the High Wardrobe in T3, in which so much of value was stored.

At second floor, there were the upper chambers in each of the four round towers and the High Wardrobe (Fig. 9). With the exception of T5, these upper chambers each had a bed with elaborate furnishings, implying that they were for important people. The one in the T2 seems to have been specifically for strangers or guests, and the one above the chapel is likely to have been occupied by the chaplain. Totalling up the number of the beds available in Holt Castle in 1495, there was a bed each for Sir William and Lady Elizabeth, 11 beds (excluding three palliasses for personal servants) in the rooms as being for the upper household and guests, and 10 beds for the lower household, giving a total of only 26. This is a smaller number than might be expected given Sir William Stanley's status and wealth at the end of his life. It became clear that the inventory did not describe every space and room in Holt Castle. A room was only described if it had moveable contents. Small ante-rooms to the towers, the latrines and the staircases are not listed. Nevertheless, the inventory does provide the most comprehensive description of the interior of the castle and reveals the disposition of the main rooms.

The inventory also lists the buildings in the outer court. These were the brewhouse, bakehouse, slaughterhouse, the kiln, stable, ox house, another four stables, a storehouse, poultry house and a chamber for the poulter, garners, an outer gatehouse (whose upper chamber was for prisoners), a chamber for the hunt, a porter's lodge, corn barn, hay barn, and finally the courthouse. Many of these buildings can be found on Norden's plan of 1620 (Fig. 11), to be discussed below.

Tidderley's survey

Palmer in his articles on Holt includes a partial extract from a survey of Bromfield and Yale undertaken by a man called Tidderley and kept in the National Archives.[74] It is undated but Palmer places it at the end of the reign of Henry VIII. The survey includes an account of 'the castell of the Holte'. Tidderley describes an outer gate with timber work, joined on to the east by a stable and to the west by a barn. Also to the west is a timber courthouse, beyond which is the hedge and pale of the Little Park. The outer ward contains a garden, a dove house of timber and a summer house or arbour made of a quick set hedge and a timber frame. These arrangements can also be seen on Norden's plan (Fig. 11).

Tidderley describes the castle as standing level with the town on a rock. It is 50 paces from the outer gate to the first ward of the castle, which consists of a square tower (the Chequer Tower of the inventory). It is reached by a bridge of timber and has a pair of gates and a portcullis at each end of its entrance passage, which is 30 feet (9m) long. Beyond is another wooden bridge, 20 feet (6m) long. The moat is 50 feet (15m) deep below this bridge. The entrance into the main castle is described as

40 feet (12m) long; with a pair of strong gates at either end and an iron portcullis above the doorway. The castle is said to have had all the offices needed by a prince to keep his house in. On entering the courtyard and turning left, a straight flight of broad, stone steps is described as rising into the hall, with the buttery, pantry and a kitchen with a draught well to the left or low end. There is a large fireplace on the external wall of the hall which has a doorway at its upper end opening into the great chamber with two other chambers 'rownde abowte bwilte being the highest storye castellyke, with chimneys yn eury of theyme'.[75] Later, a fair chapel is said to be within the castle and in the king's gift. The description identifies that there are three storeys of lodgings under the hall and great chamber, containing the houses of office, including a horse mill and a stable. The castle is described as five square with a five-storey round tower at every corner, with the towers having a chimney for each of its storeys and a staircase opening out onto the lead roof. The leads offer fine prospects and there are two staircases leading down from the main roofs into the courtyard. Finally a secret narrow way down vaulted stone stairs from the courtyard, leads down to the river Dee, where the ward is secured by a door of iron.

   Though this survey does not describe the whole building, it is the only source of information concerning the access into the hall. It also tells us that only two of the courtyard staircases rose to roof height and confirms that there was access down from the courtyard into the basement and hence into 'Pottrells Pit' which opened out into the river Dee. It also implies that every chamber had a fireplace and so was represented by a chimney on the roof.

The inquiries of 1586/87 and 1587/88

Palmer also includes extracts from two inquiries carried out by the king's representatives, regarding the use of the castle.[76] Some of the evidence given addresses where the constable and his deputy had their chambers and where they took and housed their prisoners. The first inquiry taken in January 1586/87 describes how the constable ascended to his chambers by taking the stair on the right on entering the courtyard. His suite consisted of a great chamber with a chamber beyond which he used as an office and where he kept his coals and wood, and in the connecting tower, a bedchamber with a chimney in it.[77] This follows the medieval arrangement where it was normal to house the constable over the main gate so he could control access into the castle. This suite was being used by his deputy. Prisoners were taken into the constable's great chamber and then down into the adjoining tower where they were detained. Mention is also made of the access to the river Dee but that the iron door which secured it had been taken away. The evidence in the inquiry held in January 1587/88 is a little contradictory. One of the constable's servants dwelt in the 'utter gatehouse', whilst the porter had rooms on then right-hand side of the main castle entrance. The 'utter gatehouse' (the inventory's outer gatehouse?), was used to house debtors and minor offenders whilst felons and murderers were kept safe in the main castle.

The Duchy of Cornwall plan

Another plan of Holt Castle, not known to Palmer and Butler, was recently discovered in the National Library of Wales by Paul Hinchliffe (Fig. 10). It is contained in the Duchy of Cornwall records and is dated by the library as *c.* 1600.[78] The plan shows the basement level. It is depicted as a regular pentagon with a round tower at each corner.[79] Each of the round towers and the curtain walls are drawn with parallel lines, as if they had flared bases, like those shown on the Holme view, discussed below (Fig. 14). Most prominent is the straight-sided projection from the base of the Chapel Tower. On a flap of paper folding out from the main sheet is a wide solid black line representing the river Dee with a water channel running off at right-angles to the river entering into the base of the tower. The legend on the flap reads 'This does signifie the water of Dee with gate for passage into ye pottrell's pit.'
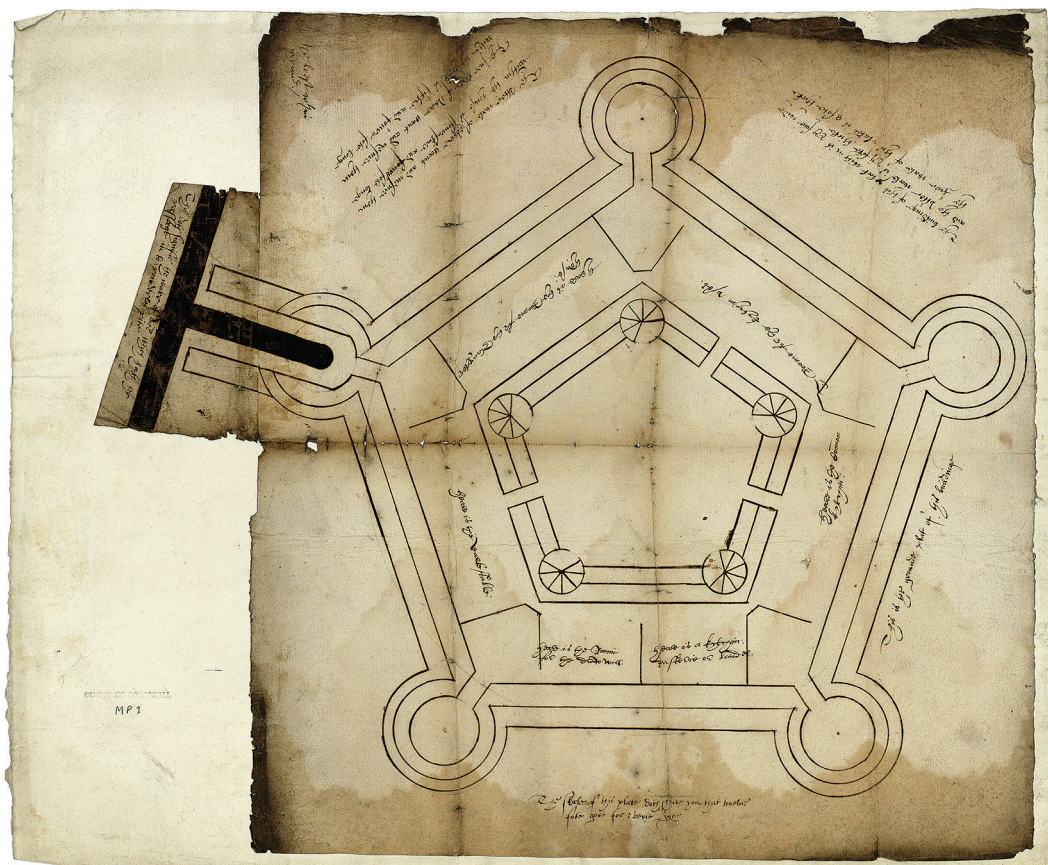
Fig. 10. Plan of Holt Castle of *c.* 1600 from the Duchy of Cornwall's archive. © *Duchy of Cornwall: supplied by Llyfrgell Genedlaethol Cymru – National Library of Wales, GB0210 Duchy.*

The courtyard is also drawn as a regular pentagon with a spiral staircase in each corner with lines down the centre of the joining walls suggesting that these too may have had flared bases, though there is no evidence for this on site. There are central doorways in three of the sides. The internal divisions are quite sketchily drawn with a triangular space at the end of each range, enclosing an entrance into the base of each tower, and a passage between the ranges against the courtyard wall. The larger rooms are each described. Below where the main entrance would have been (the range is at the bottom on Fig. 10), the main room is divided into two. To the east the room is marked 'Here is the roome for the draw well' and that to the west 'Here is a kytcyn, pasterie and larder'. Continuing around in an anticlockwise direction there is 'Here is the common kytcyn', 'Roome for the kytcyn uses', 'Here is the roome for the slaughter house', and 'Here is the great stable'. The legends in the field tell us that it is a ground plot of the building and provides a series of dimensions to the different parts.

What is most important about this plan is that it confirms there was a rectangular projection from the Chapel Tower which contained an artificial channel running from the river Dee. It implies that all the basement rooms were accessible, partly interconnected, and perhaps still in use. There is no door shown on the watergate, perhaps confirming that it had been removed, as recorded in the inquiry of 1586/87.

John Norden's plan and view of 1620

John Norden (*c.* 1547–1625) was the best cartographer and surveyor of his day. During his early career, he worked for a number of private patrons, but in 1600, he was appointed surveyor of the Crown's woods and forests in southern England, and in 1605 he added the surveyorship of the Duchy of Cornwall. Initially he farmed this post to another surveyor until in 1611, the prince's council ordered surveys of 43 manors across all of its estates in an attempt to generate more revenue. Norden took back the surveyorship and from 1611 until 1623, he travelled extensively around England and Wales. In a document of 1623, appealing for additional payment, he listed the 176 manors and townships that he had surveyed in the previous six years, many more than once.[80] By then he was well into his seventies and he was helped in his surveys by his son John junior. The prince's estates had been much neglected during Elizabeth's reign and Norden's work was instrumental into putting the duchy's affairs into profitable order.[81] The surveys he produced were delivered as a series of volumes—one for each of the prince's main estates—listing all the lands held by the prince, the name of the tenant, the form of tenure, the area and the value. They were presented as vellum-bound albums. The one for Bromfield and Yale was submitted in 1620.[82]

The Bromfield and Yale album survives intact as British Library Harley MS 3696. A letter attached to the flyleaf says it was given to Edward Harley, earl of Oxford and Mortimer, in 1736 by Thomas Bowen. It is a monumental piece of work extending over both sides of 353 folios of tightly written descriptions of the individual holdings in each of the seventeen manors making up the lordship. John Norden and his son John were empowered to raise a jury for each manor who had to confirm testimony about who held land, under what tenure and with what value in that manor. In addition to the text, there are a few watercolour and ink drawings consisting of: a Latin dedication in an 'antik work' cartouche (folio 3), the view of Holt Castle (Fig. 12 and folio 5), the plan of Holt Castle (Fig. 11 and folios 5ᵛ–6), a plan of Holt great park or Marsley Park (folio 44), a plan of Glynn Park (folio 57), a plan of Park y Cuming—formerly a rabbit warren (folio 58), and a map of lands bordering Burton Manor (folio 82). The information used to produce this album was gathered over the spring of 1619.[83] Norden gave a lot of detail about the condition and value of the castle directly on his plan, but expanded on the estimate of the quantities and value of the recoverable materials on folio 6ᵛ, in which he explains that: 'One maynfloor fell the very night I came to Holt'. He expanded on this even further when summarising the evidence given to the jury for the manor of Villa Leonis, in which the castle lay (folio 24). Folio 25 lists the other appurtenances of the castle outside and in the town, as the little park, a pool, some meadows and the tolls taken for crossing Holt Bridge.

The plan of the castle (Fig. 11) has north at the bottom, and no scale is given. The moat is described as rock hewn. The main castle is approached down a path marked 'The outer gate of the castle yarde'. The Chequer Tower is marked with a C and the legend says 'In a lofte over C lye all the records and was anciently the Chiquer'. Beyond the bridge it is marked a, 'At a the moat is 30 foot deepe under this bridge and was a draw bridge'. Each of the round towers is marked with a ǫ, and the legend reads 'ǫ, four round towers with mani Lodgings and chimneys covered as is all the Castle that yet stands, with lead.' The rectangular T3 is inscribed with the legend 'There is a vault under this square tower secretly to come to the river at 23 were is an Iron gate as is sayd'.

The second gate opens into a paved passageway through the buildings and into the courtyard. To the right, the range between T1 and T2, which earlier records show was the kitchen, has the legend: 'At this place Lead and all inward material fallen down'. Between T2 and T3 it reads: 'Great Chambers and other Chambers', and between T3 and T4: 'Butteries, Pantries, Kitchens etc.'. Finally the range between T4 and T5 is marked 'The Hall'. There is a doorway shown in the inner wall of each range, staircases in each tower and there is a staircase rising into the hall, and into each of the five towers. A circular well is shown at the centre of the courtyard for which no physical evidence has been found.
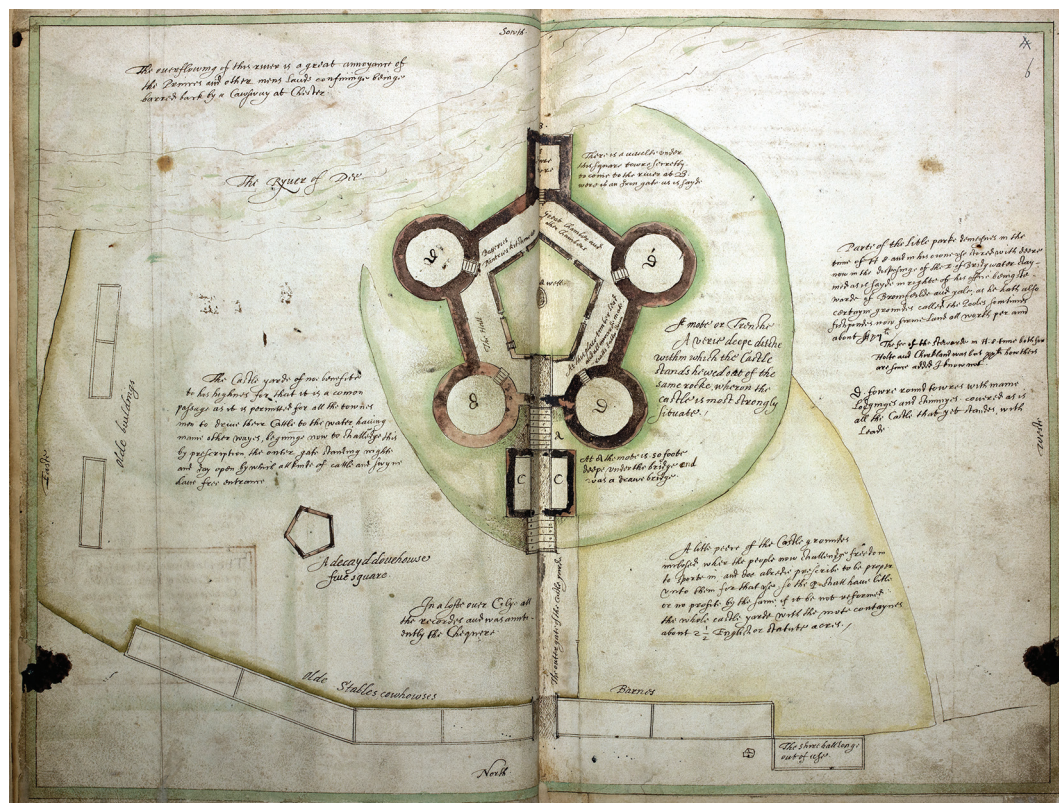
Fig. 11. John Norden's ground plan of 1620. © *The British Library Board, Harley MS 3696, folio 6.*

The outer court has two rectangular ranges marked as 'olde buildings', which may include some of those listed in the Stanley inventory from the brewhouse to the slaughterhouse. There is also a pentagonal, freestanding building in the outer court marked: 'A decayed dovehouse five square' not listed in the Stanley inventory. To the east of the outer gate and forming part of the boundary of the castle precinct is a long range made up of four rectangular buildings marked 'Olde Stables cowhouses', with a similar two buildings marked 'Barnes'. Standing forward of this latter range is another building marked 'The Shire hall longe out of use'. Thomas Arundel's charter of 1411 included for the seneschal to hold two general courts in the lord's name at Michaelmas and Easter, to which the burgesses owed suit.[84] The shire hall will have acted as this courthouse. The plan also refers to the little park and fishponds attached to the south of the castle precinct. The ranges shown flanking the outer gate were clad with weatherboarding, whilst the outer gate and the shire hall are timber-framed buildings with rectangular glazed windows, the latter with a gothic-arched door.

Norden's associated view of the castle shows the bridge over the moat to the Chequer Tower has handrails but does not appear to lift (Fig. 12). A raised portcullis can be seen in front of the stout door in this tower. Beyond, there is a partly-raised drawbridge, and a raised portcullis within the second gate. Over the gate is the large shield with a lion passant-guardant, flanked by mullioned square windows. The towers and the outer curtain walls rise from flared bases standing in the moat. Each of the round towers is shown with crenellations on corbelled parapets with a tall staircase vice on the lead roof. The towers

Fig. 12. John Norden's view of 1620. © *The British Library Board, Harley MS 3696, folio 5.*

flanking the second gate each have an exaggerated vertical arrowloop with circular oillets, and the other two have cross loops and oillets. The upper chambers of these latter two towers seem to have been lit by a ring of circular windows.

   The most problematic part of Norden's survey is his representation of T3. The plan (Fig. 11) shows it as rectangular at first-floor level, with its long axis, north to south. The view (Fig. 12) shows it as rectangular but with its long axis east to west. The entrance from the wall-walk has been given a later emphasis into a rectangular shape (hiding a heraldic device?), and it is flanked by square glazed windows. A horizontal oilleted loop is shown on its visible side. The tower is castellated but has no staircase access to its flat, leaded roof. Based upon the analysis of the Stanley inventory, this upper stage of this tower was the High Wardrobe, but the legend on the plan states that it is over the vaulted watergate, shown on the other two plans to be an extension of T4. The courtyard ranges are depicted rather crudely, with their roofs and the wall-walks conflated into a narrow space, and with crenellations on the inner and outer faces. There is only one line of large, square, mullioned and transomed, windows set quite high up in the walls.

   Where Norden's plan differs from the other two examples described above is that it was taken at first-floor, rather than ground-floor or basement levels. The plan hints at the flared bases of the round towers and outer curtain walls with a green wash, but gives no indication of the rectangular projection from T4. The use of square windows in the range over the second gate, in the courtyard elevations and in the top stage of T3, all suggest that later alterations had been made to the late thirteenth-century castle.

   Norden was a very experienced surveyor and it is hard to imagine how he made such obvious mistakes in preparing and drawing up his plan and view of Holt Castle. However, his primary purpose when working for the Prince of Wales was to measure and value parcels of land, not to produce plans and elevations of major buildings like Holt Castle. Our conclusion is that John Norden, by now an old man, was working under enormous pressure, travelling all across England on primitive roads. He travelled as far afield as Kent, Cornwall and Yorkshire, as well as going north-west into Denbighshire. What he was paid to do, and rather meanly it would appear, was to produce written land surveys. The plan and view of Holt Castle was therefore a one-off. They were drawn a year after Norden had been at Holt, and may have been based on notes and sketches rather than any form of measured survey. Norden was concerned to identify what value could be derived from the castle precinct, hence the copious annotations, rather than to show what it looked like. The problem is that Norden's plan and view are seductive images, which are those most frequently reproduced to illustrate the 'lost' Holt Castle. The plan showing T3 with a rectangular plan is now fixed in people's minds. It is even used on the modern town badge of Holt. Replacing Norden's images with those generated by this project will be a struggle.

The Holme plan and view

These two drawings are to be found in the British Library Harley MS 2073. The majority of this volume is a collection of images produced by the Cheshire engraver and antiquary, Daniel King (1616?—61?).[85] However, amongst King's work are bound a number of rather cruder plans and views of the cathedral, churches and former monastic houses of Chester. These are followed by drawings showing the castle, town gates and main bridge of that city (folios 79–105). Following soon after are drawings in the same hand of plots and elevations of Writhen [Ruthin] Castle (folio 110), Shotwick Castle (folio 111), and then of Holt Castle (folios 112–13). Palmer when introducing these drawings of Holt says: 'But the truth seems to be that when King first saw the Castle it was recently dismantled; and as he wished to give a drawing of it, he used the sketch (probably collected by one of the Randle Holmes), which was the only representation available to him'.[86]

   Further on in the Harl. MS 2073 is Daniel King's undated engraving 'An Orthographical Designe of Severall Viewes Upon Ye Road on England and Wales'.[87] Among the thumbnail images included are

versions of the Writhen and Holt Castle views found earlier in the volume. The extensive material on Chester can be confidently ascribed to one of the Randle Holmes and those of the other castles, including Holt, are in the same style and handwriting, so Palmer was right to associate them with this family. There were four generations of Chester heralds and herald painters of this name: Randle I (1570/71–1655), Randle II (*c.* 1601–59),[88] Randle III (1627–1700), and Randle IV (*c.* 1659–1707).[89] It was either Randle Holme II or the III who undertook the antiquarian drawings contained within this volume. If the images of Holt were made before the siege of 1646 had damaged the fabric, then they must date from no earlier than say 1620, when Randle II was aged about twenty, to 1645, when Randle II was about 45 and Randle III was eighteen. Butler's dating of these drawings to 1562 is therefore incorrect,[90] and though they have been assumed to be the earliest of the three images we have of Holt Castle, they were the latest to be produced.

The Holme plan shows the entrance to the castle over the moat, which is described in the associated legend as 20 yards (18m), or in some places more, broad (Fig. 13). The 'Chequer House before the Gate' is mentioned and the 'Gate' is clearly marked as passing through the courtyard range. To the left of the gate is a room called the well house, with a circle indicating the position of the well. Moving around in the direction taken by the commissioners of the Stanley inventory, the kitchen is marked between T1 and T2, 'office rooms for cook and Buttler', between T2 and T3, a stable between T3 and T4. The word 'chapel' is written into the square projection from T4. A stable is also shown between T4 and T5.

Careful consideration needs to be given to at what level this plan has been drawn. The entrance through the 'Chequer House', the 'Gate' and the courtyard are at ground floor. However, the legend written on the courtyard says 'Fro the court to the battlemts of the castle but two storeys high. All these named being under ground'. This can be confirmed in most cases by comparing this plan with the Stanley inventory access diagram (Fig. 6). The exception is the chapel marked in the square projection. The positioning of doorways and staircases needs to be looked at in some detail. There is a door from the 'Gate' apparently directly into the well house and the room opposite. This unnamed room corresponds to the candle house in the inventory. What is being drawn here is the basement level below the gate. The rooms below the gate open into the kitchen, which has four internal projections from its curtain wall, which could be the jambs of cooking hearths. The kitchen is also accessed from the courtyard by a door at its centre (which still survives) and a straight flight of steps that seem to descend to a lower floor level. The kitchen is only separated from the offices for the cook and butler by a dotted line, suggesting a lost or flimsy partition, and these offices are entered by a doorway and short flight of steps from the courtyard, similar to that into the kitchen. There is no access from the offices into the stables where a solid masonry wall is shown.

From the entrance passage it was possible to pass through the well house into each of the stables in turn. The first (underlying the hall range) is shown as having two flights of straight stairs from the courtyard, and there is a doorway through the outer curtain wall. Near this door is a curving passage through the curtain wall, and leading to the spiral staircase in the Chapel Tower. A triangular room is formed against the base of the Chapel Tower with another curving passage into the wall of the tower, probably leading to a latrine. The second stable was below the range containing the lord's great chamber, corresponding with the storehouse in the inventory. It is shown as being entered directly from the courtyard by a straight flight of steps.

In the courtyard, spiral staircases are shown in the angles opposite T1, T2 and T3, rising to the floor above. Each of the towers has a spiral staircase in positions that correspond with those shown on the contemporary elevation (Fig. 14). The only one to connect with the named rooms on the plan is in the T4 Chapel Tower, implying, as does the Stanley inventory, that the basements of the other towers were only reached from above. The Holme view is drawn, slightly obliquely, from the north-east. The Chequer Tower is diminished in size and detail, compared to the second gate and the panel with the lion passant-

Fig. 13. Randle Holme's plan of Holt
Castle. © *The British Library Board,
Harley. MS 2073, folio 112.*

Fig. 14. Randle Holme's view of Holt
Castle. © *The British Library Board,
Harley MS 2073, folio 113.*

guardant above, which have been exaggerated. The gate is shown within an architectural frame, topped with a corbel table and suggesting some carving in the spandrels.[91] A portcullis can be seen hanging in this gate and also in the Chequer Tower. Above the second gate is a blank wall at first floor and a semi-circular panel with the lion at second floor, immediately below the crenellations. This presents a problem as the Stanley inventory and the Norden view (Fig. 11), show only two storeys in this range, confirmed by the legend on the Holme plan. The relative heights of the round towers are correct, with a single vertical loop in the flared basements, and single light windows above. Arrowloops are also shown in the merlons of the front two towers. There are staircase vices shown on all five towers, each heightened with an additional turret.

The range between T5 and T4 runs obliquely away from the viewer. The draughtsman has made a mistake in joining the ground and first floors of the T5 to the first and second floors of T4, but is correct in showing there to be two floors over a basement. The door through the base of the curtain wall corresponds to that shown on the plan into the stable, and a pair of dotted lines hints at an access up from the bottom of the moat into the stable.

The draughtsman has shown T4 as having four storeys over a basement, as reconstructed from the Stanley inventory (see Fig. 6). The rectangular projection from this tower is shown as rising to the full height of the round tower, but to have two-light windows rather than the single-light windows, as shown elsewhere on the exterior. The style and asymmetry of this projection suggests it was the work commissioned by Richard II in 1398 and 1399. This work must have created single rooms spanning both the round and rectangular parts of this tower, as the Stanley inventory does not differentiate between the two. The experience of creating the three-dimensional model proved that the details of the Holme plan and view were accurate, even though the draughtsmanship was clumsy and the dimensions were inaccurate.

The Buck Brothers view of 1742
This is the last image of the site to add any information about the former appearance of the castle.[92] What is important is that it offers a view from across the river looking at the east side of the castle. There is an irregular lump rising from the centre of the 'quarry' with stubs of walling on top. Of more interest is the curving base of T5 rising from the base of the moat/quarry and two piers of walling on the site of T4. Both piers suggested a ground level archway with a window in the storey above. The left-hand pier seems to stand forward of the right-hand pier, which has the ragged walling of a return. These are most likely to represent part of the front and back walls of the watergate and Pottrell's Pit. There is an impression of sunken way on the line of the channel from the river.[93]

CREATING THE 3D DIGITAL MODEL

The digital reconstruction began by modelling the existing remains, using the computer-aided design (CAD) programme called Autodesk Inventor; a programme initially designed for engineering work but which incorporates a degree of flexibility not found in some programmes specifically intended for architectural design projects. All subsequent work took the form of additions to this basic model, with each level of the castle, the Chequer Tower, and a variety of other features being modelled separately for convenience and ease of access to detailed work. All parts were designed to be ultimately assembled into a whole.

An accurate scale model was first created of the pinnacle of rock crowned by the surviving inner courtyard walls around the northern and western sides, along with the staircase on the eastern side. This was done using the topographical survey data augmented by additional measurements made on site, after

later clearance works had exposed more detail. The outer faces of the pinnacle were also modelled using the topographical survey data, and the walls, floor levels and ceiling joist holes of the lowest chambers were located on the vertical plane, and emphasised on the horizontal plane to graphically reveal that the floor levels in the basement ranges were far from constant (Fig. 1). The historic plans could then be overlain at courtyard level and carefully manipulated and resized so that the drawn courtyard walls could be matched to the modelled walls. On the southern side, where the walls were no longer upstanding or had not been uncovered, the line of the wall faces of the basement rooms provided a guide. This was necessary as the plans were not reproduced to scale, and by carefully matching them to the remains, their real scale would be revealed.

This exercise made it clear that the Duchy of Cornwall plan (Fig. 10), provided the most accurate proportional fit to the inner courtyard, and when subsequently scaled, the width of the ranges on this plan also matched the widths described, as did the interior dimensions of the towers. The fit encompassed the full width of the drawn walls. The parallel lines already noted within the courtyard walls, at first thought to indicate a batter, did not feature. There clearly was no batter on the surviving courtyard wall, and it must be assumed that this extra line was purely a construction line, part of the rigid geometric system that the draftsman employed when making this drawing. While the proportions of the Duchy of Cornwall plan were found to be more accurate than those of the Holme plan (Fig. 13), it was almost totally lacking in detail, and the finer points of the Holme plan would subsequently prove invaluable when modelling the interior layout of the castle.

The Duchy of Cornwall plan now provided the size and locations of the towers and curtain walls at courtyard level, presently floating in mid-air. Excavation beneath these locations should provide evidence at or below current ground level which could determine the batter of the tower bases. The trenches revealed some core material which may have related to tower bases, but only one containing facing stones that could be directly linked to the plan form above it (Fig. 5), and this was at the base of the T5 Kitchen Tower. By extrapolating the remains in the excavation into a complete circle and linking that with the smaller circle created by the plan at courtyard level above, a three-dimensional batter was created for the base of this tower. The same batter was then applied to each of the other four towers. A similar batter was extended around all five of the curtain walls as such a batter is shown on all the early views although no evidence was found in the archaeological excavations.

Finally, the Chequer Tower, missing from the Duchy of Cornwall plan, was located in a similar way, where the dimensions noted from Tidderley's survey were applied at courtyard level, and confirmed by excavation below, where the bases of two opposite corners had been uncovered to provide a rectangular plan which could be extended up to courtyard level. However, the centreline of the base proved to be off-set from the centreline of castle by just over a metre, and this would need to be accommodated in some way as the model proceeded (Figs 7 and 15).

In reconstructing the external appearance of Holt Castle, details were borrowed from appropriate contemporary buildings. In the case of the original castle, much use was made of the Inner Ward of Conwy Castle, in particular for the form of the towers, their stair turrets and latrines. The windows of the original castle were based on examples surviving in the great gatehouse at Denbigh Castle, and it was assumed that these windows remained unaltered until 1495 at Holt. The only later windows were those found in Richard II's extension to T4, and these were based on examples surviving in his inner bailey at Portchester Castle.

Before raising the walls up to battlement level, the stub floors were extended out to the curtain wall, and internal partitions were created on these floors using the Holme plan as a pattern. The arrangement of such walls is consistent with other polygonal buildings such as Old Wardour Castle (Fig. 18), where rectangular rooms are created within the ranges and smaller irregular or triangular shaped spaces accommodated in

Fig. 15. An external view of the digitally reconstructed Holt Castle from the north-west.
Digital image: Chris Jones-Jenkins.

the angles between. Such spaces do not always having a recognisable practical use, though in Holt they would clearly provide access to the turrets and towers.

Remnants of some of these walls survived on the outer faces of the pinnacle of rock, even confirming the locations of doors, as in the surviving doorjamb on the south-eastern corner to the right of the iconic surviving doorway (Fig. 1), which broadly correspond to those shown on the Holme plan (Fig. 13). Another such wall on the south-west corner also marks the most drastic change in floor level in the basement, while also accommodating the large drain emerging from within the courtyard (Fig. 1). Significantly, this wall is not broken by a door on the plan, and is shown terminating near a shaft in the curtain wall. Similar door jambs survive either side of the 'gate' as previously mentioned, all of which serve to confirm the general reliability of this plan.

However, it had to be assumed that not all partition walls were shown on the Holme plan. The western two ranges have only one dotted line between them. This may indicate a collapse or perhaps a timber partition in this area. Indeed there may in fact be more timber partitions elsewhere that were not shown on the 1562 plan, and at this stage the consideration of the room layout (Fig. 6) derived from the Stanley inventory suggested where those missing partitions might be located.

For obvious structural reasons the upper floors essentially follow this same pattern of partition walls as those shown on the basement plan, with some minor variations as dictated by the room layout interpreted from the inventory and largely confined to the corner spaces or an occasional lighter timber partition. The

overall external appearance, however, was derived from the Holme view, and when used in conjunction all three were found to conform closely. For example, the apparent random locations of all five of the turret staircases on the plan correspond exactly with the turret locations shown in the view (Figs 13 and 14), while the somewhat asymmetrical placing of courtyard staircases in only three of the five corners can be made to correspond with the route taken by the commissioners when writing the 1495 inventory. Furthermore, two of the three are at either end of where the inventory places the reconstructed full height kitchen (Fig. 16), and hence they are required for continued access round the ranges. While the bases of these two survive on site, the third is now missing but has been adopted from the plan and added to the model, as it provided essential access to the reconstructed private chambers which the inventory located here.

One particularly puzzling instance of corroborative evidence is that of the previously mentioned doorway shown on the left-hand side of the castle in the Holme view, which might otherwise be taken for a sally port (Fig. 14). A door is also shown on the basement plan within a room named as a stable (Fig. 13), and where the inventory also places a stable. Part of the courtyard wall of this room survives intact on site at a level that would not have permitted direct access to the courtyard, unless via a staircase which has now disappeared. The placing of a stable in this location, accessible only from the moat, is a very unusual if not unique design feature for a medieval castle, but nevertheless is supported by all the evidence at our disposal and has consequently been reconstructed in the model (Fig. 4).

One aspect of the Holme view which was not helpful, however, was its representation of the Chequer Tower, which is reduced to a miniature in front of the castle, when the measurements included in the inventory and the excavation results suggest a much more substantial structure. The off-set of the centre-lines of this tower and the main castle, which has already been mentioned, required more explanation that this view could supply, so the reconstruction of this tower included additional elements that have been interpreted from the otherwise discredited Norden view (Fig. 12), such as possible buttresses on the western side, which combined with a staircase inferred from the Inventory description of the tower having three floors, enabled the gate passage through this tower to be pushed eastwards and be realigned with the centre-line of the castle gate.

In addition to raising the walls up to wall-walk level, consideration was given to extending downwards into Pottrell's Pit, the castle's watergate. The Holme plan includes a representation of a passageway winding through the curtain wall under the T4 Chapel Tower and apparently exiting through the tower base, as well as the usual spiral stair, this time augmented by another passage. This is interpreted as an indication of the access to the watergate, and an attempt has been made to reconstruct this access as part of the model. The height differential between the surviving floor level at this point and the river level is about seven metres, and such a large fall could not be practically accommodated within the length of passageway shown on the plan. Consequently a longer passageway has been reconstructed in this location utilising a more practical staircase, while still offering an indication of the difficulty of creating and using such an access in reality.

Numerous details and apparent discrepancies such as these were discussed at great length as the 3D model took form and solutions were put forward. The relationships between the rooms described in the inventory also progressed into three dimensions and the complete castle evolved to incorporate the complexities of movement around and through the various groups of apartments, and most of these considerations were satisfactorily resolved. However, as the larger issues were accommodated, so other general issues came to light which though peripheral in many ways required further insight and to some extent a greater degree of creativity.

As mentioned earlier, the pattern of windows in the Holme view was considered significant and reproduced in the model. However, more windows were required than were shown in that view, so the smaller corner rooms received small slit windows often tucked into the angle of the tower and the curtain
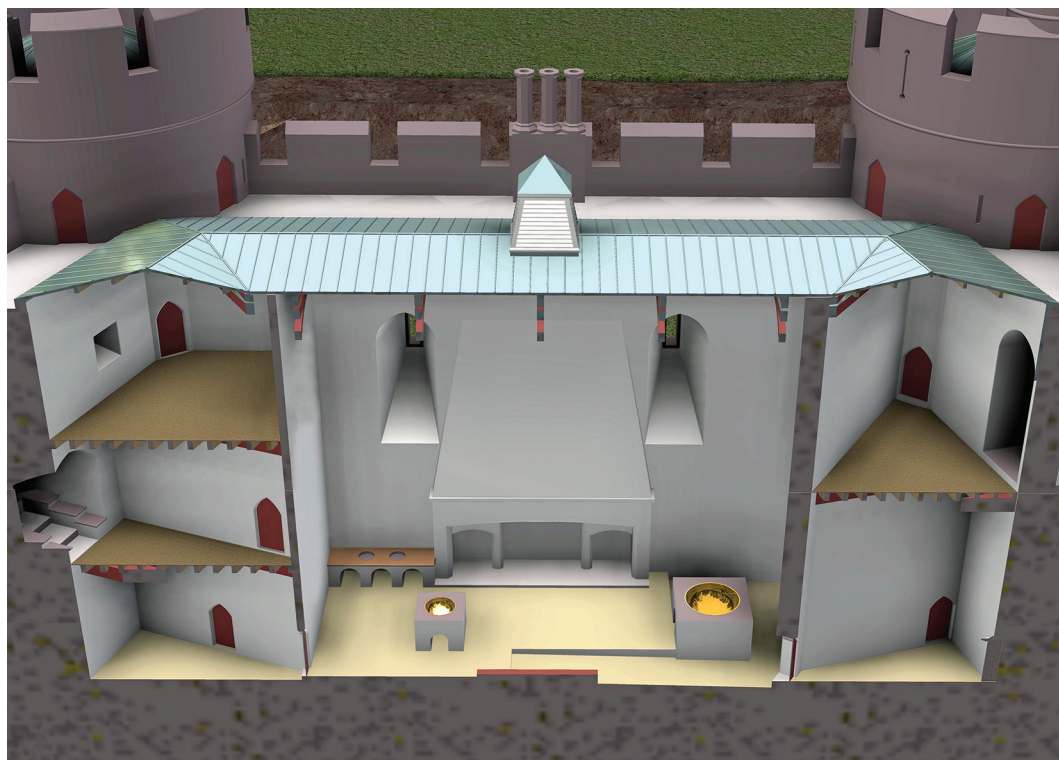
Fig. 16. Cutaway image of kitchen range viewed from within the castle courtyard.
Digital image: Chris Jones-Jenkins.

wall, which the draughtsman did not show on the Holme view. Also, not all the rooms can have been included in the inventory. Some of the smaller rooms may have been empty of anything worthy of note, and consequently did not appear. Among those rooms absent from the inventory were the garderobes, though a castle of this standing would have had numerous examples. To rectify this, other castles of the Edwardian period were examined and their garderobe accommodation studied as examples. Conwy Castle provided particularly relevant layouts, often using the space in the angle between a tower and the curtain wall to contain the garderobes which could then be accessed from the spiral stair. A generic form derived from this arrangement was conceived for the Holt Castle model and applied to each tower. They were stacked one above the other so as to utilise a single shaft, and the offset of spiral stair was used to decide the precise location in each case. This location again allowed small slit windows to be tucked unobtrusively into the angles between the towers and the curtain wall.

However, while the inventory made no mention of garderobes, there was one intriguing piece of evidence included in the Holme plan, the shaft in the curtain wall at the end of the drain emerging from the courtyard, already mentioned earlier. The exterior of this part of the castle is not visible in any of the early views. The location of this shaft in the reconstructed model, between the private apartments on the first floor and tower T3, suggested that a particular arrangement of garderobes existed for the lord at this point, and not the generic system conceived for the other towers. Consequently a private garderobe accessible only from the private apartment was modelled in the curtain wall, accessed via a mural passage

Fig. 17. Cutaway image of the hall range and T4 Chapel Tower from the north-east. *Illustration: Country Life Picture Library/Chris Jones-Jenkins.*

which in turn led on to the treasury in the tower, enabling this room to be isolated from the public area otherwise accessed from the spiral stair.

While the majority of the reconstruction is a result of the painstaking assembling of disparate pieces of evidence, these more imaginative features, the mural passage to the treasure house and the staircase from Pottrell's Pit, are among those to be highlighted in the animation of the castle, along with the full height kitchen (Fig. 16), the hall and general views of the exterior and courtyard (Fig. 17).[94]

THE ANIMATION OF THE DIGITAL MODEL

Chris Marshall of Mint (Motion Ltd), Cardiff explains the process of converting the digital model into animated video suitable to be posted on the internet. The model created by Chris Jones-Jenkins was imported into 3D Studio Max. This software has largely been used for creating 3D models and animation for computer games, but over the past eight to ten years, Autodesk have added a lot of functionality to allow for the conversion of CAD files, including Autodesk Inventor files as used for the Holt Castle model. By importing the main scene files into 3D Studio Max, the information could be displayed in an application designed for media and entertainment, rather than engineering or architectural uses. The Inventor file for the castle was huge, nearly 4 gigabytes, which was enormous for a 3D model, even a complex one like this. So the second advantage of importing the model into 3D Studio Max was to try and strip out the unwanted software modelling data, leaving just the basic geometric information. The new file that was created was a fraction of the original size at approximately 30 megabytes.

This new file was then read into the 3D application Autodesk Softimage, one of a number of the more sophisticated 3D software applications that have dominated feature film effects for the past fifteen years. After the data was imported the geometry was more or less intact, though the materials did not appear to be on the correct surfaces. This was the main issue when moving from one application to another. Whilst the geometry could be quite easily fixed it was the surface renders which differed dramatically between the different applications, so remaking the surface colours and textures was the main time-consuming exercise. Also, where there are 'hard edges', the software decides which polygons to blend across, causing slight problems. For example, on a round turret, the surface is made of a myriad of individual flat faces which need to be smooth 'blended'.

Other features, such as doors, portcullises and the drawbridge, need to be animated so that they could open or rise to let the camera through. These individual components needed to be made, textured and then remodelled before being fitted into the main model. Trees, grass and water were added around the outside of the castle, before the images were lit to improve the visual quality of the animation. The last step was to animate a camera around the model. This is far from straightforward, as it is very easy to become disorientated when 'flying' a camera around inside a CGI (computer-generated imagery) model, a problem often seen in fly-throughs of architectural models. It is best to make a CGI camera only do what a real camera can do in the real world, keeping the motion as smooth as possible and using shadows to help keep the viewer's sense of direction and orientation. Lastly it is essential to make sure that the final sequence actually renders in a sensible time frame. Each frame time renders took about two minutes to produce and there were 3,000 frames to render to produce the short final video.[95] It was decided to take the viewer through two of the main routes around the castle. The first started in the outer ward crossed the moat into the Chequer Tower and on over the drawbridge and via the second gate into the castle's courtyard. From there the viewer is taken into the kitchen, which rises the full height of the building, back across the courtyard and up into the hall. The route then leaves the hall at the dais end into the great chamber and down the passage into the treasure house. Leaving through a window the viewer then comes

down river to enter the castle via the watergate and Pottrell's Pit, up the staircase into the storehouse, where the door leading up to the courtyard magically morphs into the surviving stonework.

THE DEVELOPMENT OF HOLT CASTLE

Phase 1: castle of John de Warenne, sixth earl of Surrey

There is no evidence of there being a castle at Holt prior to the creation of the lordship of Bromfield and Yale in 1282. The castle is not documented until 1311, and it may be assumed to have been completed by that date. Previous authors have suggested that Holt Castle was built around an existing island of rock adjacent to the west bank of the river Dee.[96] However, standing on the newly-accessible courtyard today, it is clear that the interior is level with the surrounding land on which the modern town of Holt stands. Our analysis sees the designer of the castle laying out his plan on a gently shelving plain which ended as a low cliff alongside the river. The plan of the castle and the moat were then quarried down to the present level, on which the towers and outer curtain walls were founded and then built back up. This allowed the symmetrical pentagonal plan to be realised, and for a level access to be created across the moat, through the Chequer Tower and into the main courtyard. It also allows for the reconciliation of the number of floors within the towers and the two storeys of the courtyard ranges, shown in the illustrations.

Our reconstruction of Warenne's castle assumes that the rectangular structure added to the Chapel Tower was an alteration to the original plan, and that there was no water-borne access into the castle in the late thirteenth century (Fig. 15). The only access would have been through the Chequer Tower, acting as a barbican tower and a forward line of defence, with a portcullis and wooden doors (Fig. 7). The use of a barbican tower standing in a moat can be found for example in phase 3 work at Caerphilly Castle, and the Outer Gate at Conwy Castle, which stands over the original ramped approach.[97] Some care needs to be taken in identifying the Chequer Tower as original, as John, the seventh earl of Surrey, added a barbican tower, to his pre-existing castle at Lewes in the mid-1330s.[98] The second gate at Holt is through the inner curtain wall flanked by tall round towers. A similar main gate can be found at nearby Chirk Castle, and was also used in the entrance into the outer ward at Conwy Castle.[99]

Phase 2: work commissioned by Richard II

The documentary evidence shows that at the end of July 1398, Richard II commissioned a master mason and a master carpenter to carry out work at Holt Castle. They were empowered to impress 20 skilled men each, who would have been supported by labourers, carters, quarrymen and other trades, making a sizeable workforce. They could have been at work for up to a year before Henry Bolingbroke's men seized the castle in August 1399. During that period a vast amount of coin and precious goods were sent to Holt Castle for safe keeping.

The most likely outcome of these works was the rectangular extension of the Chapel Tower (Fig. 17) shown on the Holme plan and view, and the Duchy of Cornwall plan. However, the archaeological evidence found on site of the channel dug from the river to what was the watergate into the castle confirms the slightly eccentric alignment of the Holme plan, rather than the symmetry of the Duchy of Cornwall plan.

Holme's view shows two-light windows in the rectangular extension as opposed to lancet windows elsewhere, which would support a late fourteenth-century date. The watergate would have been into the bottom level of the Chapel Tower. The analysis of the 1495 inventory (Fig. 6) indicates that there was a dungeon, 'Pottrell's Pitte', identified at sub-basement level. The legend on the Norden plan described a vault under the square tower so that people could secretly come to the river closed by an iron gate. The text on the Holme plan and the inventory both suggest that there were four storeys above the sub-basement

level. The analysis of the inventory does not imply that the rectangular extension to the Chapel Tower created separate rooms, but provided extensions to the existing circular rooms in the tower. The extension to the chapel faces broadly east and could have provided a site for the altar. The plan of the chapel in the inner ward of Conwy Castle is similar, except that the presbytery was constructed within the body of the wall of the tower.[100]

It is not possible to identify with certainty whether any other alterations were undertaken in this phase. However, it was Richard II's clear intention to create a well-protected treasury within the safety of his new principality of Cheshire. This may have led to internal alterations to increase the level of security for the valuables contained within. The rooms identified in the inventory in T3 as the Treasure House and the High Wardrobe may have originated at this date and then been used by later owners for similar purposes.

Phase 3: fifteenth-century and Tudor period

There is no documentary evidence for alterations or extensions to Holt Castle in the fifteenth or sixteenth centuries. The only indication for any alterations are the rectangular windows shown in Norden's view of the courtyard elevations of the lord's great chamber and hall ranges, and in the top floor room of T3 (Fig. 12). The timber-framed outer gate and the Shire Hall, and the weather-boarded barns and animal houses forming the roadside ranges may date from this broad period.

One aspect of Holt Castle on which light may be thrown from this period, is the size and height of the principal rooms. The 1495 inventory lists the hangings stored in the castle. In the hall there were eight pieces of blue say embroidered with Sir William Stanley's hart's heads and his motto. In the High Wardrobe, there were six sets of hangings in store for which dimensions were given. Four of these were relatively plain and in a cloth described as verdure (one decorated with rabbits). One of these was only a small piece, and the length of the other three ranged from 14½ yards to just less than 40 yards. All were 3½ yards deep. The other two sets were pictorial illustrating two biblical stories. These must have been displayed where the full story could be seen and understood. The first of these was the story of Judith and Holofernes (called the Story of Olyfarnus in the inventory). This was in three good pieces of counterfeit arras (painted cloth?), two of 8½ yards and one of 11 yards, giving a total length of 28 yards, all 3½ yards deep. The second was of eight good pieces of counterfeit arras of the Siege of Jerusalem made up of two each of 3¼ yards and 4 yards, and one each at 6, 7, 8 and 12 yards, totalling 47½ yards. All were 4 yards deep.[101] The width of the courtyard ranges at Holt Castle has been reconstructed as 5.5m (6 yards) wide.[102]

None of the pieces of the Judith and Holofernes set would fit comfortably on a party wall suggesting that they would require a blank wall (the inside of the curtain wall?) at least 17 yards long, with a gap on the opposite wall between the windows of 11 yards. The story tells of Judith, a chaste Jewish woman, beheading the Assyrian general, Holofernes, in his tent when he tries to force his intentions on her.[103] Whether this would be suitable for the hall seems unlikely and may have been a better subject for the lord's, or more likely, the lady's great chamber. With the Siege of Jerusalem, one piece measured 6 yards long, which could have hung behind the dais on a party wall. This left over 40 yards to be accommodated in the remainder of the room. At Holt Castle, a room of this size would fill one of the courtyard ranges, and could only have been the hall or the lord's great chamber. At 4 yards high, they would probably have hung from the wall plate down to the top of a dado, perhaps painted or made of wainscot, suggesting a room height of at least 5m (16 feet) high.

Given that Sir William Stanley's estate was forfeited to the crown, it is possible that these two sets of biblical arras were retained in the royal collection. The very detailed inventory of King Henry VIII's possessions, taken in 1547, lists the subjects of the hangings at the various royal palaces. At Westminster, there was a stained cloth with 'thistorye of Judith', and also 'Thistorie of Judith striking of Olifernus headde paynted upon tike'. More interesting was that amongst the items stored in the 'guarderobe' at

Windsor was a set of seven pieces of arras of the Siege of Jerusalem put into seven canvas bags, with one piece at least 10 yards long.[104]

Phase 4: demolition and robbing of the castle's masonry

There are no reports of the extent of the damage of the nine-month long siege at Holt Castle in 1646. Norden's plan comments that the internal structures of the range containing the kitchen had collapsed in 1619, so the castle was already in decline by this date. Much of the masonry of Holt Castle was demolished between 1675 and 1683, to be used in the building of Eaton Hall, near Chester. The accounts for this work survive in the Eaton Muniments and show that the stone was boated down the river Dee to a landing known as Eaton Boat on Sir Thomas Grosvenor's estate. The remains of a barge sunk whilst carrying some of this stone survives on the river bed near the castle.[105]

Suggestions have been made in the past that much of the site that survives today results from quarrying undertaken during this period. Based on the reconstruction of the phase 1 castle described above, it seems much more likely that what survives today was the result of the systematic dismantling of the ashlar masonry down to its foundation level, and then the shelves of rock below the basements were also cut away. This was not as comprehensive as the site's present appearance suggests, as the Buck Brothers' view of 1742 shows part of the watergate and T5 still standing.
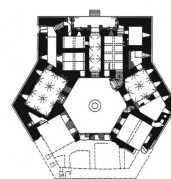
GEOMETRIC CASTLES

There are a small group of castles which have a geometric plan and a symmetrical external appearance, of which Holt Castle, as originally built, was one (Fig. 18). In western Europe, the first of these buildings was Castel del Monte, Apulia, Italy. It was built by the Hohenstaufen emperor, Frederick II between 1230 and 1240.[106] It has an octagonal plan with octagonal towers at each angle and an octagonal courtyard. Octagons are used extensively in the internal planning of the building. A regular octagon is easily constructed by laying one square at a 45° angle over a square of the same size. An eight-pointed star is made by drawing chords between the opposite corners which then forms an internal octagon like the courtyard at Castel del Monte.[107] The castle acted as a hunting lodge and stands prominently on a low ridge of hills a few kilometres inland from the important medieval coastal cities of Apulia.

The second of these geometric castles was built by a man of much humbler birth, Sir Herbert de Maxwell (d. 1298) at Caerlaverock, south-west Scotland. He built his new castle on a rocky platform about 200m away from the earlier fortified site erected by his uncle, Sir John de Maxwell (d. 1241). The new castle had an equilateral triangle as its plan, with a small round tower at its east and west corners, and a pair of towers at the north corner to form the gatehouse. The castle was contained within a broad, water-filled inner moat, and a narrower, now dry, outer moat. The upper parts of the curtain walls and the gatehouse, and the internal layout were rebuilt in later centuries.[108]

Caerlaverock Castle was the scene of one of the great gatherings of English chivalry during Edward I's reign. He summoned his magnates and the other men who owed service to the crown to muster in Carlisle on the feast of the Nativity of St John the Baptist, 24 June 1300. This force of 87 knights and 3,000 men marched to Caerlaverock, where they laid siege to the castle garrisoned by just 60 men.[109] The events were recorded in a contemporary French poem, probably written by a herald present at the siege.[110] The poem describes the pageantry of the event and the splendour of the English camp and its mounted men-at-arms. Amongst those present was John de Warenne, sixth earl of Surrey, the king's senior commander in Scotland. Was it the magnificence of this event and the symmetrical plan of Maxwell's castle that inspired him to commission Holt Castle?
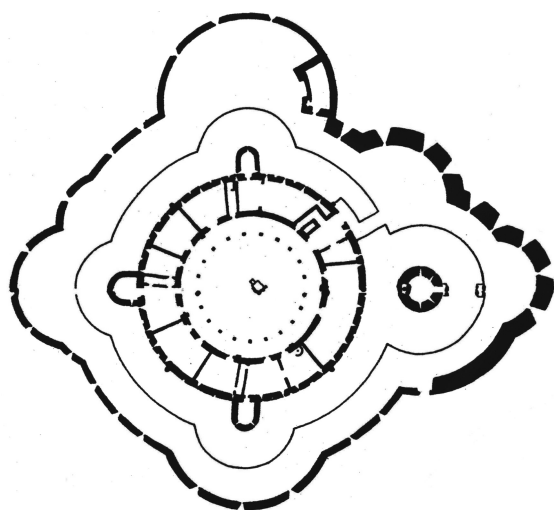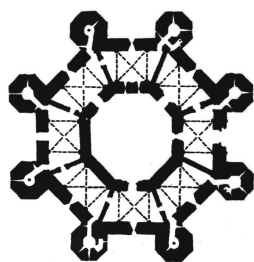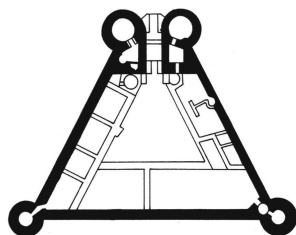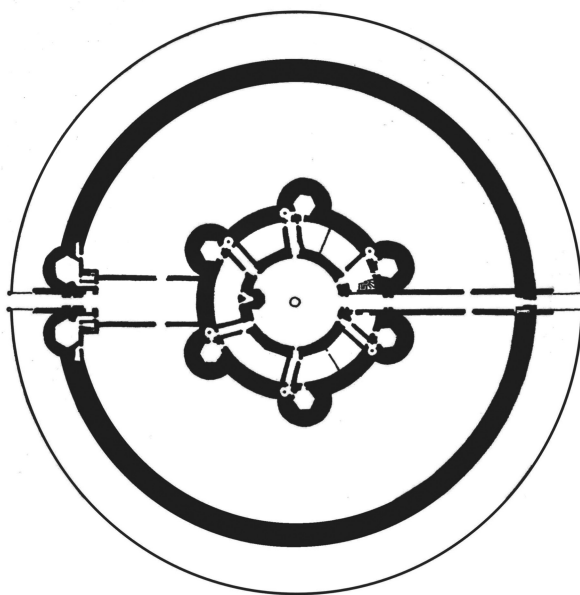
Castell de Bellver

Old Wardour Castle
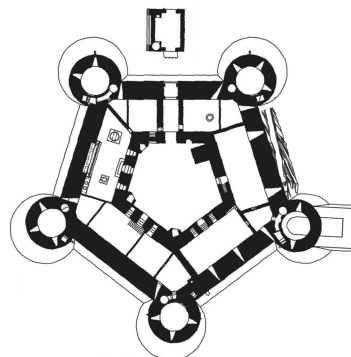
Holt Castle

Castel del Monte

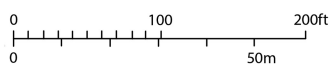Caerlaverock Castle

Queenborough Castle

Fig. 18. Comparative plans of six geometrical castles. *Drawing: Chris Jones-Jenkins.*

A little bit further into the fourteenth century was the construction of the remarkable Castell de Bellver, Palma, Majorca. It was built by King Jaime II (1276–1311) as a summer retreat on a prominent hill outside the city between about 1300 and 1310. It is circular in plan with a two-storey loggia surrounding the circular central courtyard. Added to the main structure are four circular turrets (one detached) and a complex outwork whose plan is made up of a series of arcs of circles. Julian Munby has seen Castel del Monte and Castell de Bellver as potential inspirations for Edward III's House of the Round Table constructed from 1344 in the Inner Ward of Windsor Castle.[111] When this was dismantled, Edward III started on another complex circular building, Queenborough Castle.

Queenborough Castle was remarkable as the last wholly royal castle built in England during the Middle Ages. It had a unique plan form and external appearance. Unfortunately, there are no standing remains from which to appreciate its scale and magnificence. There is only documentary and a limited amount of archaeological evidence of what was built. Before its total demolition in the mid-seventeenth century, an Elizabethan plan, a view by Wenceslaus Hollar, and a seventeenth-century survey were produced and have survived. Taken alongside the original building accounts, it allows for an accurate reconstruction of the layout and design of the castle to be envisaged.[112]

Work began in the spring of 1361 on the 'rotunda', the main accommodation block, forming a circle around an open courtyard or inner ward, at whose centre was the castle's well. Projecting from the outside of the rotunda were six round towers, two of which were larger and placed close together to form a gatehouse to a walled approach from the east. The outer ward was formed by a circular curtain wall with a twin-towered gatehouse controlling the entrance from the town to the west. The outer wall had a wide moat around it.[113] Excavations and graphical reconstruction by *Time Team* in 2005, estimated the central courtyard to be 16–17m in diameter, the outer wall of the rotunda to be 38–40m in diameter (with the towers projecting another 6m) and the outer curtain wall being 84–5m in diameter.[114]

Sufficient progress had been made with the castle's chapel to mount within, two, newly purchased and expensive images of the Assumption of the Virgin Mary.[115] By 1366, the rotunda was nearly complete and work had started on the outer moat. The curtain wall on the inner side of the moat was constructed from 1368 to 1371. The accounts say work was finished by May 1375, and the total cost of building the castle has been estimated at about £20,000.[116]

The name, Queenborough, was not used in the documents before 1367, when it was applied to the adjacent new town. This was in honour of Queen Philippa.[117] Up to that date, the usual reference was to 'the king's castle at Sheppey'. Edward III was a frequent visitor. Initially, he camped in the grounds when he came to inspect the building work, but later he used a suite of apartments in the rotunda.[118] The documents are not clear on how often Philippa accompanied him, or even visited the site on her own. She was never to see the castle finished for she died on 15 August 1369, the Feast of the Assumption.[119]

What lay behind the design of this castle has been the subject of some debate. The editors of *The History of the King's Works* thought 'that it exemplifies the principles of cylindrical and concentric fortification carried to their logical conclusion with perfect symmetry.'[120] They later point out that, though it resembled the artillery forts constructed in Henry VIII's reign, no cannon were mentioned in the accounts, just trebuchets. They finally concede that the castle was a residence rather than a fortress.[121] John Goodall, in his extensive survey of the English castle, has tried to fit the design of Queenborough Castle into the emergence of the Perpendicular style of architecture. He shows that the project was overseen by William of Wykeham, the paymaster of the king's remodelling of the Upper Ward of Windsor Castle (1359–69). The named master mason at Queenborough was John Box, the master mason of Edward III's Round Table building at Windsor Castle.[122] For Goodall, 'The design of Queenborough Castle exemplified the aesthetic characteristics of the Perpendicular style.'[123] Its design was to influence a number of great

towers in England with symmetrical plans and central courtyards, later in the fourteenth century, such as Old Wardour Castle, Wiltshire, and the Little Keep at Warkworth Castle, Northumberland.[124]

What distinguishes the five geometric castles described in this section? They seem to have had five attributes:

1. The patron and/or his master mason were interested in Platonic or Euclidean geometry.
2. They needed a clear and relatively flat site so that the geometrical shape could be easily laid out.
3. There was no overriding military or strategic need for these castles, some of which were intended as retreats.
4. The patron's wives and households had to be willing to put up with non-standard layouts and odd-shaped rooms.
5. There may have been an allegorical basis for their design.

This last attribute needs to be explored in more detail. As Jill Mann points out, 'The landscape of medieval allegory is rich in architecture', and she traces much of its inspiration to two biblical texts, the imaginary recreation of Solomon's Temple (Ezekiel 40–54) and the description of the City of Jerusalem (Revelation 21).[125] Ezekiel is interested in both measuring the building using a long rod, and in describing its symmetry. This process is repeated by the angel who describes the layout of the City of Jerusalem. These biblical descriptions were to inspire medieval authors when they constructed their imaginary castles.[126]

The question that follows from this is whether the inspiration for the design of these geometric castles was allegorical and inspired by religious texts? For example, Abbot Aelred, in his mid-twelfth-century sermon on the Assumption of the Virgin Mary described a castle which represented an allegory of the chaste body of the Virgin Mary. He wrote:

> Therefore let us prepare this castle. Three things make up a castle, so that it might be strong, namely a ditch, a wall and a tower. First the ditch, and after that a wall over the ditch, and then the tower which is stronger and better than the others. The wall and ditch guard each other; because if the ditch were not there, men would by some device get in and undermine the wall; and if the wall were not above the ditch, they would get to the ditch and fill it in. The tower guards everything, because it is taller than everything else![127]

This passage can be compared with the sequence of structures visible on the surviving illustrations of Queenborough Castle. Edward III took a great interest in the design and building of this castle, and it was achieved at great cost. It seems to have little strategic importance, and its defensive arrangements seem playful rather than addressing an actual threat of siege. The erection of the two expensive statues of the Assumption of the Blessed Virgin in the castle's chapel, suggest that it, and perhaps the whole castle were dedicated to that aspect of her cult. Queenborough can be seen as the physical expression of Aelred's and other authors' allegorical castles representing the chaste body of the Virgin, perhaps raised in honour of his own wife, Philippa, after she had passed child-bearing age. As well as texts these geometric castles could be inspired by holy buildings. Emperor Frederick II led the sixth crusade setting sail from Brindisi to Acre in 1227. He signed a treaty in 1229 which saw Frederick enter Jerusalem and visit the Dome of the Rock—thought by medieval Christians to be the site of Solomon's Temple—though the building remained in Muslim hands.[128] Was this remarkable seventh-century octagonal Arab mosque the inspiration for Castel del Monte?

In the case of Caerlaverock and Holt Castles, the geometric form is different. Caerlaverock's triangular plan could well represent the Holy Trinity. What significance has the pentagonal Holt Castle? There is

a passage in *Sir Gawain and the Green Knight* that revels in the imagery of the number five.[129] Sir Gawain is being armed before setting out to find the Green Knight. He is given his shield that has a pentangle emblazoned on the front, a symbol of Solomon. It represented Gawain's personal qualities but also his trust in the five wounds of Christ inflicted on the day of his crucifixion, and in the five joys his mother, the Virgin Mary, had in her child. These were the annunciation, the nativity, the resurrection, the ascension and her assumption into heaven. As late as 1495, the inventory of Holt Castle recorded that a chest in the High Wardrobe contained items for use in the chapel including two altar frontals, one showing the Assumption and one showing the Coronation of Our Lady, and another frontal with a figure of the Trinity.[130] Perhaps Holt Castle as a whole was intended to be an allegorical representation of the Virgin Mary.

ACKNOWLEDGEMENTS

NOTES

1.   Lawrence A. S. Butler, 'Holt Castle: John de Warenne and Chastellion', in John R. Kenyon and Richard Avent (eds), *Castles in Wales and the Marches: essays in honour of D. J. Cathcart King* (Cardiff: University of Wales Press, 1987), 105–24.

2.   Alfred Neobard Palmer, 'The Town of Holt in County Denbigh: its castle, church, franchise and demesne', *Archaeologia Cambrensis*, 6th ser., 7 (1907), 1–34 (Chapter II – Section II); 311–34 (Chapter II – Section I the Lords and Charter of Holt); 389–434 (Chapter III – Norden's Survey of 1620); 6th ser., 8 (1908), 155–82 (Chapter IV – The Castle and Municipality of Holt); 273–83 (Chapter V – some Holt Houses and families); 305–44 (Chapter VI – Holt Church, VIII).

3.   British Library (BL), Harley MS 2073, fos 112–13.

4.   BL, Harley MS 3696, fo. 5 (view), and fo. 6 (plan).

5.   Wrexham County Borough Council commissioned the artist, Phil Kenning, to produce these paintings for the on-site interpretation: see <http://www.wrexham.gov.uk/english/heritage/holt_castle/reconstructing.htm>, and the leaflet guide, *Holt: the Lion's Castle* (Wrexham 2014).

6.   An animated fly-through of the digital model can be viewed on YouTube at <https://www.youtube.com/watch?v=Wv_sHru_OG0>.

7.   H. M. Colvin (ed.), *The History of the King's Works*, vol. 1 (London: HMSO, 1963), 334, referring to the *Calendar of the Welsh Rolls*, 240.

8.   R. R. Davies, *The Age of Conquest: Wales 1063–1415* (Oxford: Oxford University Press, 1991), 363.

9.   P. H. W. Booth, 'The corporation of Holt, the manor of Farndon, and the bridge over the Dee, Denbighshire', *Archaeologia Cambrensis* 146 (1997), 109–16.

10.   Derrick Pratt, 'The de Warenne lords of Bromfield and Yale', *Transactions of the Denbighshire Historical Society* 62 (2014), 21–72.

11.   *Calendar of Patent Rolls 1307–1313*, 405, discussed by Pratt op. cit. (note 10), 44.

12.   Scott L. Waugh, 'Warenne, John de, sixth earl of Surrey [earl of Surrey and Sussex, Earl Warenne] (1231–1304) magnate', *Oxford Dictionary of National Biography*, Oxford University Press, 2004 (ODNB on-line), <http://www.oxforddnb.com/view/article 28734>, accessed 5/4/2013. The numbering of the earls of Surrey follows the *Oxford Dictionary of National Biography* on-line edition. *The Complete Peerage*, by G. E. Cokayne, rev. and ed. by Geoffrey H. White, vol. XII, part I (London: St Catherine's Press, 1953), 499, has this earl as the seventh and his grandson as the eighth earl of Surrey.

13.   William was granted the lordship of Bromfield and Yale from 3 August 1284 until his death on 15 December 1286 by his father. The lordship was administered by the Crown until February 1287 when it reverted back to John (Pratt op. cit. (note 10), 28–32).

14.   Scott L. Waugh, 'Warenne, John de, seventh earl of Surrey (1286–1347); magnate', ODNB on-line, <http://www.oxforddnb.com/view/article 28735>, accessed 5/4/2013.

15.   John A. A. Goodall, 'The baronial castles of the Welsh conquest', in Diane Williams and John R. Kenyon (eds), *The Impact of the Edwardian Castles in Wales* (Oxford: Oxbow, 2010), 155–65.

16.   Butler op. cit. (note 1), 105.

17.   The *Calendar of the Patent Rolls 1494–1509*, refer to the appointment of the constable of the Castle of Lyon in 1502 (p. 262), but by 1509 the reference is to the constable of Holt Castle (p. 525).

18.   T. P. Ellis, 'The First Extent of Bromfield and Yale', *Cymmrodorion Record Series* 9 (1924), 39.

19.   Butler op. cit. (note 1), 106 fn. 12, questions Ellis's reading of this part of the document.

20.   Ellis op. cit. (note 18), 47. See also, M. Rogers, 'The Welsh Marcher Lordship of Bromfield and Yale, 1282–1485', unpublished doctoral thesis, University of Wales, Aberystwyth, 1992.

21.   Scott L. Waugh, 'Warenne, John de, seventh earl of Surrey', ODNB on-line, <http://www.oxforddnb.com/view/article 28734>, accessed 5/4/2013.

22.   Palmer 1907 op. cit. (note 2), 11, and discussed by Pratt op. cit. (note 10), 61–71.

23.   *Register of Edward the Black Prince*, I (London: HMSO, 1930), 96–7. Their report refers to 'the castle of Lyons, lately called the castle of le Holt', the first mention of its modern name.

24.   C. Given-Wilson, 'Fitzalan, Richard (III), fourth earl of Arundel and ninth earl of Surrey (1346–1397), magnate', ODNB on-line, <http://www.oxforddnb.com/view/article 9535>, accessed 5/4/2013, quoting BL, Harley MS 4840, fo. 393.

25.   For a modern study of the Fitzalan family and their role in the Marches see Michael Burtscher, *The Fitzalans Earls of Arundel and Surrey, Lords of the Welsh Marches (1267–1415)* (Woonton Almerley, Herefordshire: Logaston Press, 2008).

26.   R. R. Davies, *The Revolt of Owain Glyn Dŵr* (Oxford: Oxford University Press, 1995), 39.

27.   BL, Add MS 10,013.

28.   Davies op. cit. (note 26), 40 and 73.

29.   J. G. Bellamy, 'The northern rebellions in the later years of Richard II', *Bulletin of the John Rylands Library* 47 (1964–65), 265–6.

30.   Anthony Tuck, 'Lords appellant (act. 1387–1388)', ODNB on-line, <http://www.oxforddnb.com/view/article 53093>, accessed 6/2/2014.

31.   Michael J. Bennett, *Richard II and the Revolution of 1399* (Stroud: Alan Sutton, 1999), 90–103.

32.   C. Given-Wilson op. cit. (note 24).

33.   On 25/9/1397. See R. R. Davies, 'Richard II and the Principality of Chester', in F. R. H. Du Boulay and C. M. Barron (eds), *The Reign of Richard II: Essays in honour of Mary McKisack* (London: Athlone, 1971), 256–79.

34.   Davies 1971 op. cit. (note 33), 262.

35.   Anthony Tuck, *Richard II and the English Nobility* (London: Edward Arnold, 1973). See chapter 7 'Richard's tyranny and deposition', pp. 187–225.

36.   Bennett op. cit. (note 31), 129.

37.   James L. Gillespie, 'Richard II's Cheshire Archers', *Transactions of the Historical Society of Lancashire and Cheshire* 125 (1975), 1–39.

38.   Bennett op. cit. (note 31), 129.

39.   *Calendar of the Patent Rolls 1396–1399*, 402 and 443.

40.   Bennett op. cit. (note 31), 131 fn. 170.

41.   Ibid. 145, based on The National Archives (TNA) E/101/411/9 and E 403/651 mm 3, 7 and 14.

42.   Jenny Stratford, *Richard II and the English Royal Treasure* (Woodbridge: Boydell, 2012), 112, based on *Calendar of the Patent Rolls 1401—5*, 167. Stratford, in her analysis of the inventory of the royal treasure taken at the end of Richard II's reign, shows that valuables were seized from the earl of Arundel's treasury at Holt within a month of his execution, and reached the London treasury in April 1398. Amongst the items in the inventory that can be linked to Arundel were a coronet, a gold rosary and a covered cup (pp. 72–7).

43.   Bennett op. cit. (note 31), 161–2.

44.   Jean Creton, 'A metrical history of the deposition of King Richard the Second', ed. by J. Webb, *Archaeologia* 20 (1824), 122. This description does not describe the entrance across the bridge, through the Chequer Tower, but sounds more like Henry's troops entered through the watergate and Pottrell's Pit.

45.   Creton op. cit. (note 44), 125.

46.   Davies op. cit. (note 26), 102.

47.   G. L. Harriss, 'Fitzalan, Thomas, fifth earl of Arundel and tenth earl of Surrey (1381–1415) soldier and administrator', ODNB on-line, <http://www.oxforddnb.com/view/article 9536>, accessed 5/4/2013.

48.   Rosemary Horrox, 'Richard, duke of York and duke of Norfolk (1473–1483)', ODNB on-line, <http://www.oxforddnb.com/view/article/23504>, accessed 30/3/2016.

49.   *Calendar of the Close Rolls of Edward IV, Edward V and Richard III, 1476–1485*, entry numbers 103, 407, 1225, 1353, 1380, 1184 and 1322, all refer to Holt Castle and the lordship of Bromfield and Yale.

50.   M. K. Jones, 'Sir William Stanley of Holt: politics and family allegiance in the late fifteenth century', *Welsh History Review* 14 (1988), 1–22.

51.   Michael K. Jones, *Bosworth 1485: the Psychology of a Battle* (Stroud: History Press, 2002), 24–5.

52.   Jones op. cit (note 50), 10. This lordship was obtained by exchange of his lordship of Skipton with Richard, duke of Gloucester.

53.   *Calendar of the Patent Rolls 1476–1485*, 368.

54.   *Calendar of the Patent Rolls 1476–1485*, 516. The grant refers to 'his good service against the rebels.' For the full text of the grant see *Archaeologia Cambrensis* 37 (1882), 150–2. Sir William Stanley had been given permission to take possession of Bromfield and Yale on the king's behalf as early as 11 January 1484 (BL, Harl. MS 433, item 1661).

55.   Michael Bennett, *The Battle of Bosworth* (Stroud: Alan Sutton, 1985), 79–122.

56.   Michael J. Bennett, 'Stanley, Sir William (*c.* 1435–1495)', ODNB on-line, <http://www. oxforddnb.com/view/article 26282>, accessed 17/09/2015. The king commuted his sentence from hanging, drawing and quartering to beheading, and also paid for Sir William's burial at Syon Abbey, Middlesex: see A. F. Pollard, *The Reign of Henry VII from Contemporary Sources* (London: Longmans 1913–14), vol. 1, 103, and vol. 2, 230.

57.   TNA, E/154/2/5.

58.   Jean M. Gidman, *Sir William Stanley of Holt* (Leeds: Rosalba Press, 2003), Appendix 1, The Inventory of Holt and Ridley, 63–77.

59.   *Calendar of the Patent Rolls 1494–1509*, 14, 16 and 42.

60.   Palmer 1907 op. cit. (note 2), 23.

61.   TNA, SP1/85, fo. 57–8. The 'Porte' was the Ottoman court in Constantinople, and this may be to what the quotation is alluding.

62.   E. W. Ives, 'Brereton, William (*c.* 1487 × 90–1536) courtier and administrator', ODNB on-line, <http://www.oxforddnb.com/view/article 70865>, accessed 5/4/2013.

63.   BL, Cotton MS Augustus 1, vol. 1, no. 9.

64.   Thomas Churchyard, *The Worthines of Wales, a Poem 1587*, reprinted (London: Thomas Evans, 1776), 107.

65.   Peter Gaunt, *A Nation under Siege: the Civil War in Wales 1642–8* (Cardiff: Cadw, 1991), 36–7 and 61–3.

66.   John Roland Philips, *Memoirs of the Civil War in Wales and the Marches 1642–1649*, 2nd edn (London: Longmans, 1878), 363.

67.   Gaunt op. cit. (note 65), 63.

68.   Colvin op. cit. (note 7), 335. Full records survive in the Grosvenor muniments in the Cheshire Record Office and extracts were published in the *Cheshire Sheaf*, 10 May 1939.

69.   These surveys were undertaken by James Brennan Associates, in 2010, for Wrexham Borough Council, and the information was kindly provided by Steve Grenter of Wrexham Museum and Archives.

70.   Stephen Grenter, 'Gazetteer of sites explored in 2012: Medieval – Holt Castle Wrexham SJ 4112 5377', *Archaeology in Wales* 52 (2013), 206. For 2013, see *Archaeology in Wales* 53 (2014), 214–15, and for 2014, see *Archaeology in Wales* 54 (2015), 209–10.

71.   Gidman op. cit. (note 58).

72.   An earlier attempt to reconstruct the layout of Holt Castle was published by Derrick Pratt, 'Living like a lord – the "Great House" at Holt [Castle], 1495', *Clwyd Historian* 66 (Spring 2012), 28–34.

73.   Does this correspond with the 'pass' reported on by Creton (see note 44)?

74.   Palmer 1907 op. cit. (note 2), 312–16, quoting TNA, LR 2/249 fos 4^v–5.

75.   Palmer 1907 op. cit. (note 2), 313–14.

76.   Ibid. 317–19.

77.   This is at odds with the layout described in the inventory where the constable's chamber is in T2 (see Fig. 6).

78.   National Library of Wales (NLW), GB0210 Duchy. This collection also includes a number of written surveys of castles in Wales including Holt, made between 1618 and 1625, and the plan could have been detached from this material.

79.   The setting out marks and the holes for the compass points for this drawing are clearly visible, suggesting it was an idealised plan.

80. This document is contained in a folio notebook in Cambridge University Library (CUL), Mm iii 315, fos 20–2, which ends with a section in Norden's hand and with his signature listing each of the 176 manors and townships he had surveyed; ending with a long appeal for an ex gratia payment saying that he had not been properly rewarded for his labours.

81. Frank Kitchen, 'Norden, John (*c.* 1547–1625)', ODNB on-line, <http://www.oxforddnb.com/view/article/20250>, accessed 9 April 2013, and Frank Kitchen, 'John Norden (*c.* 1547–1625): estate surveyor, topographer, county mapmaker and devotional writer', *Imago Mundi* 49 (1997), 43–61.

82. CUL, Mm iii 315, has a section entitled 'Other Bookes of Survayes delivered in by Mr. Norden and Mr. Thorpe' in which there is an entry reading 'Denbigh: A Survaie of the Lo'd of Bromfield & Yale in the countie of Denbigh written in paper, and bound in vellum being made and perfected by Mr Norden for His Highness … Anno dm 1620.' (fo. 12ᵛ).

83. There is another album, BL, Sloane MS 3241: Yale Manor; Denbighshire: Survey of, made for Prince Charles, by John Norden, Sen. and Jun.: 1620, which seems to be the result of a separate inquiry into this part of the lordship which is dealt with rather perfunctorily in Harl. MS 3696.

84. Palmer 1907 op. cit. (note 2), 15.

85. Antony Griffiths, 'King, Daniel (*c.* 1616–*c.* 1661)', ODNB on-line, <http://www.oxforddnb.com/view/article/15555>, accessed 22/6/2016.

86. Palmer op. cit. (note 2), 88.

87. Brought to our attention and discussed by Neil Guy, *Castle Studies Group Bulletin* 20 (Summer 2015), and reproduced in the *Castle Studies Journal* 29 (2015–16), 93.

88. Anthony R. J. S. Adolph, 'Holme, Randle (1570/71–1655)', ODNB online, <http://www.oxforddnb.com/view/article/13584>, accessed 22/6/2016. King was an apprentice to Randle II: see Griffiths op. cit. (note 85).

89. Anthony R. J. S. Adolph, 'Holme, Randle (1627–1700)', ODNB online, <http://www.oxforddnb.com/view/article/13586>, accessed 22/6/2016. The Holme family's manuscript collection of 261 volumes now forms BL, Harley MSS 1920–2180.

90. Butler op. cit. (note 1), 108–10.

91. It can be compared with the external entrance into the Outer West Gatehouse at Caerphilly Castle, where the doorway is countersunk below a corbel table to allow for the drawbridge to be raised flush with the curtain wall. At Caerphilly, this feature dates from the early 1270s.

92. This drawing has been widely reproduced: see *Castle Studies Journal* 29 (2015–16), 91 for example.

93. There is a late eighteenth-century plan of Holt Castle by P. Mazell (fl. 1761–97) in the National Library of Wales (NLW, South MAP, MAP 5918) based on Norden's plan and a view based upon the Holme view published in the Castle Gallery on the Holt Local History Society website at <http://holtlhs.weebly.com/castle-gallery.html>.

94. To see a comprehensive series of views derived from the 3D-model visit the Castles Studies Trust Website at <http://www.castlestudiestrust.org/Holt-Castle-Denbighshire.html>.

95. See note 6.

96. Butler op. cit. (note 1), and Colvin op. cit. (note 7). Ernest Neaverson, *Medieval Castles in North Wales: a study of sites, water supply and building stones* (London: Liverpool University Press, 1947), 24, recognised that the site was quarried down to form its outer defences and provide the building stone.

97. For Caerphilly, see Rick Turner, *Caerphilly Castle*, Cadw guidebook (Cardiff, 2016), 34; and for Conwy, see Jeremy A. Ashbee, *Conwy Castle and Town Walls*, Cadw guidebook (Cardiff, 2007), 24–5.

98.   John Goodall, *The English Castle 1066–1650* (New Haven and London: Yale University Press, 2011), 270–1 and fig. 203. A gatehouse tower within the moat of Sandal Castle, Yorkshire may have been added to the existing castle by John de Warenne, sixth earl of Surrey about 1270 (ibid. 183).

99.   For Chirk, see Goodall op. cit. (note 98), 222–3.

100.   Ashbee, op. cit. (note 97), 38–9.

101.   Gidman op. cit. (note 58), 66. These two subjects were amongst the Cloths of Arras recorded in the inventory of Thomas of Woodstock, duke of Gloucester (1355–97) taken at his castle at Pleshey, Essex, after his exile and death in Calais. Viscount Dillon [Harold Arthur Lee-Dillon] and W. H. St John Hope, 'Inventory of the goods and chattels belonging to Thomas, Duke of Gloucester, and seized in his castle at Pleshy, co. Essex, 21 Richard II (1397); with their values, as shown in the escheator's accounts', *Archaeological Journal* 54 (1897), 275–310.

102.   Gidman op. cit. (note 58), 65–9.

103.   W. O. E. Osterley, *An Introduction to the Books of the Apocrypha* (London: SPCK, 1935), 172–82.

104.   David Starkey (ed.), *The Inventory of King Henry VIII, the Transcript* (London; Society of Antiquaries, 1998), 240, items 10,727 and 10730, for Judith and Holofernes, and 310 for the Siege of Jerusalem.

105.   Holt Local History Society, *Holt's Hidden History: an archaeological investigation* (Wrexham: Bridge Books, 2013), 25–6.

106.   Heinz Götze, *Castel del Monte: Geometric Marvel of the Middle Ages* (Munich and New York: Prestel, 1998).

107.   Ibid. 113–16.

108.   Doreen Grove, *Caerlaverock Castle* (Kirkcaldy: Historic Scotland, 1994).

109.   Ibid. 18–19.

110.   *The Roll of Caerlaverock*: for transcription and translation see <http://en.wikisource.org/wiki/The_Roll_of_Caerlaverock>.

111.   Julian Munby, 'Windsor and beyond central planning in medieval Europe', in Julian Munby, Richard Barber and Richard Brown, *Edward III's Round Table at Windsor* (Woodbridge; Boydell, 2007), 127–34.

112.   R. Allen Brown, H. M. Taylor and A. J. Taylor (eds), *The History of the King's Works: Volume II, the Middle Ages* (London: HMSO, 1963), 793–804. This article illustrates the plan (whose original is at Hatfield House), the view (in the British Museum's print collection), and the refers to the parliamentary survey of 1650 (TNA, Parliamentary Surveys, Kent, 52).

113.   Ibid. 793–8.

114.   Wessex Archaeology, 'Queenborough Castle, Isle of Sheppey, Kent: archaeological evaluation and assessment of results', unpublished report, Wessex Archaeology report 59470.01, January 2006, 21.

115.   Brown *et al.* op. cit. (note 112), 794 and fn. 8. The Pipe Roll 37 Edward III rot. comp. 2, gives the cost of carving these statues as £6 16s 8d, and TNA, E/101/483/21, m. 5, records a payment of 30s to have them painted. Taken together this implies large and expensively decorated images.

116.   Brown *et al.* op. cit. (note 112), 800. This total can be compared with the estimated costs of building Caernarfon Castle, £19,892, Beaumaris Castle, £14,444, and Conwy Castle, £14,248, two generations earlier: see Arnold Taylor, *The Welsh Castles of Edward I* (London: Hambledon, 1986), 119.

117.   In the spring of 1288, Edward I and his queen, Eleanor of Castile, were in Gascony, where the king was recuperating from an injury. They spent a few weeks laying out a new castle and town

on the banks of the Gironde called Burgus Reginae, Queensborough, named in honour of Eleanor. Marc Morris, *A Great and Terrible King: Edward I and the Forging of Britain* (London: Windmill, 2009), 212 and 215.

118.   Brown *et al.* op. cit. (note 112), 802.
119.   M. Ormrod, *Edward III* (New Haven: Yale University Press, 2011), 470–1, describes the death and burial of Philippa and how her death on this day reinforced comparisons between her and the Virgin Mary.
120.   Brown *et al.* op. cit. (note 112), 793.
121.   Ibid. 801–2.
122.   Goodall op. cit. (note 98), 289–91. For a reconstruction of the Round Table building see Julian Munby, 'Reconstructing the Round Table: Windsor and beyond', in Munby *et al.* op. cit. (note 111), 118–26.
123.   Goodall op. cit. (note 98), 291.
124.   Ibid. 321–3.
125.   Jill Mann, 'Allegorical buildings in medieval literature', *Medium Aevum* 63 (1994), 191–210.
126.   Ibid. 192–6. Mann goes on to discuss Robert Grosseteste's early thirteenth-century poem *Chasteau d'Amour*, where the castle is an allegory of the body of the Virgin Mary and Langland's late fourteenth-century 'Castle of Kind' in *Piers Plowman*, made up of the four elements earth, air, fire and water.
127.   Abigail Wheatley, *The Idea of the Castle in Medieval England* (York: York Medieval Press, 2004), 78.
128.   Götze op. cit. (note 106), 138.
129.   Lines 623–63.
130.   Gidman op. cit. (note 58), 66–7.