ART. XI. – *Excavations and Survey at Piel Castle, near Barrow-in-Furness, Cumbria*

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PIEL CASTLE lies at the southern end of Piel Island, known as Fotheray in the medieval period, between Walney Island and the mainland, and thus guards the main approaches into the deep-water harbour outside Barrow. Its general history has been documented in these transactions (Curwen, 1910, 271-87), so need not be dwelt on here. It was built by Furness Abbey and a licence to crenellate "their dwelling-house of Fotheray in Fourneys, co. Lancaster" was granted in 1327 (Cal. Pat. Rolls, 1 Edward III, 169, quoted in Curwen, 272). The wording suggests that the licence may merely sanction a *fait accompli*; the surviving remains of the castle seem to date from the early 14th century. It seems to have had a relatively short occupation, since it was reported as being ruinous by 1537, when a chronicler recorded that ". . . Castell and Pele is now sore decayed, and specially the coverynge and tymber-werke thereof" (Beck, 1844, lxii). This report is associated with the dissolution of the Abbey of Furness, however, and may have exaggerated the bad state of repair in order to excuse any despoiling. It was in too ruinous a state to be of strategic value during the Civil War, despite the presence of the Parliamentary fleet in Barrow harbour and Royalist troops in Dalton. The course of its gradual ruination can be charted by various prints of the 18th and early 19th centuries (see for example Buck, 1727, Hearne, 1781, reproduced in Curwen, 1910; Whitaker, 1823, vol. 2, 373; the Philips print of 1824). In the 1850s and 1860s, however, the Duke of Buccleuch undertook the construction of sea defences which slowed the pace of erosion on the southern and eastern sides of the castle and subsequently, in 1876-8, he made a relatively thorough restoration of the buildings (Acc. Lib. Furness, Cumbria Record Office, Barrow). The family gave the island to Barrow Corporation in 1918, and the castle was taken into the guardianship of the Secretary of State in 1919.

The castle stands on a low mound of boulder clay which forms the highest part of the island. It consists of a keep, inner and outer bailey, with a relatively elaborate defensive system connected with each. The keep is extremely unusual, comprising three parallel compartments though the easternmost of these has fallen into the sea and its walls now lie in pieces on the beach.

THE SURVEY

A major project of excavation and survey was carried out in the autumns of 1983 and 1984, by the Cumbria and Lancashire Archaeological Unit, on behalf of the Historic Buildings and Monuments Commission for England. This was in advance of a proposed full-scale programme of consolidation and repair.

The Survey Method

In the autumn of 1984, every wall of the castle was surveyed, using a theodolite and lap-held Epson HX-20 microcomputer, apart from those intramural passages not

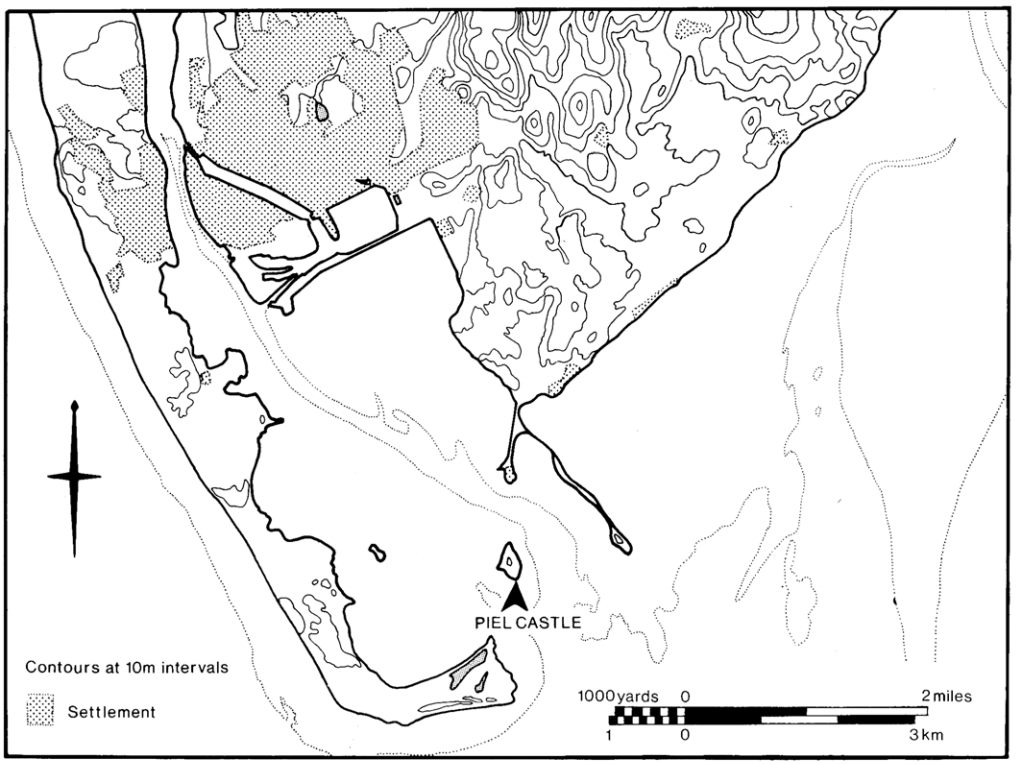

Fig. 1. – The location of Piel Castle at the entrance to Barrow Harbour.

accessible either from the ground or surviving stairways. The theodolite was set up at right angles to a chosen, identifiable point on the wall (the reference point). The horizontal and vertical angles for each point of detail were read and this information was fed into the computer, which produced x and y co-ordinates for each point relative to the reference point. The program calculated the co-ordinates at 1:50, the scale of the archive drawings, and/or at 1:1. A check on the accuracy of the survey could then be kept by taping the distance between any two points and comparing the measurement with the computed data. The accuracy of the method primarily depends on the wall being in a regular and vertical plane. Furthermore, the theodolite needs to be sited at a reasonable distance from the wall since otherwise the size of the vertical angle to a given point tends to introduce an element of distortion. The surveyed points were recorded on a photograph or sketch of the wall. After accurate plotting of these selected points, supplementary detail was added by reference to semi-rectified photographs and on site.

Analysis of the Remains

At first glance, it might appear that the castle was once concentric in plan and that a large section of the southern and eastern parts of the site has been eroded. Closer examination suggests that this is, in fact, not correct. The keep lay, with space around it on all sides, within an inner ward, the southern and eastern walls of which have since

been eroded by the sea. The outer ward lay solely to the north and west of the inner ward. The southern outer curtain wall, though now lying in pieces on the beach, appears to have once joined with the inner south-western tower. Similarly, the north-eastern towers of the inner and outer wall circuits respectively seem to have been connected by a wall.

No gate through the outer curtain remains but it is likely that this was originally near the north-eastern corner, where the island has suffered from erosion. The gateway into the inner bailey survives in the inner western curtain wall and the entrance into the keep was through its north wall. This would have meant that several turns would have had to be made to gain entry to the keep, a good means of defence. The windows of the keep, however, were obviously never designed for military purposes and would have been more appropriate in the abbey. Indeed, the site of the castle, on a low-lying island, makes it relatively easy to approach from the sea and it is doubtful whether it could have withstood a determined siege, yet its forbidding aspect may have acted as a deterrent. The castle was perhaps intended solely as a refuge for the Abbots of Furness in troubled times, or as a protection for the trade plying between the harbour and the Irish Sea.

The main body of the walls throughout the castle is constructed of roughly coursed stones, apparently collected from the beaches of the island. Most of these were worked to produce an approximately smooth surface to both internal and external walls. The major internal walls show traces of plastering and it may be that the external walls were also rendered but there are no traces of this surviving. The quality of the workmanship and the coursing varies considerably according to the location of the walling within the castle; in the less conspicuous parts the coursing frequently deteriorates. All architectural features, such as doorways, window surrounds and quoins, are constructed of red sandstone ashlar, which was almost certainly quarried in the abbey precinct and shipped across the harbour. It was worked to a high quality and has been the target for robbing, though it also suffers more obviously from erosion. The only slight change in overall building technique is visible in the western outer towers, where numerous thin courses of local stone and some red sandstone are interspersed with broader ones. These do not seem to designate building lifts.

It is clear that both the outer and inner moats were excavated before any of the walls were built. The upcast was thrown on to the inner lip of each moat and the curtain walls and corner towers were constructed on top of it. This is particularly clear at the north-western corner of the outer bailey, where the south and east walls have been constructed over the slope of the upcast, necessitating extra foundations at the south-eastern corner of the tower. The moat, with its upcast, terminates immediately to the north of the outer south-western tower, which was built just above the beach.

The Outer Curtain

It seems likely that the curtain walls were constructed before the corner towers and the inner gatehouse, presumably as part of a single building programme. The western and north-western outer curtain wall does not survive above foundation level and may not have been completed, although the Buck print (1727) appears to show decayed remains of it. The north-western tower therefore stands in isolation, although at the points where the curtain wall would have linked with it, the stones of the wall are not

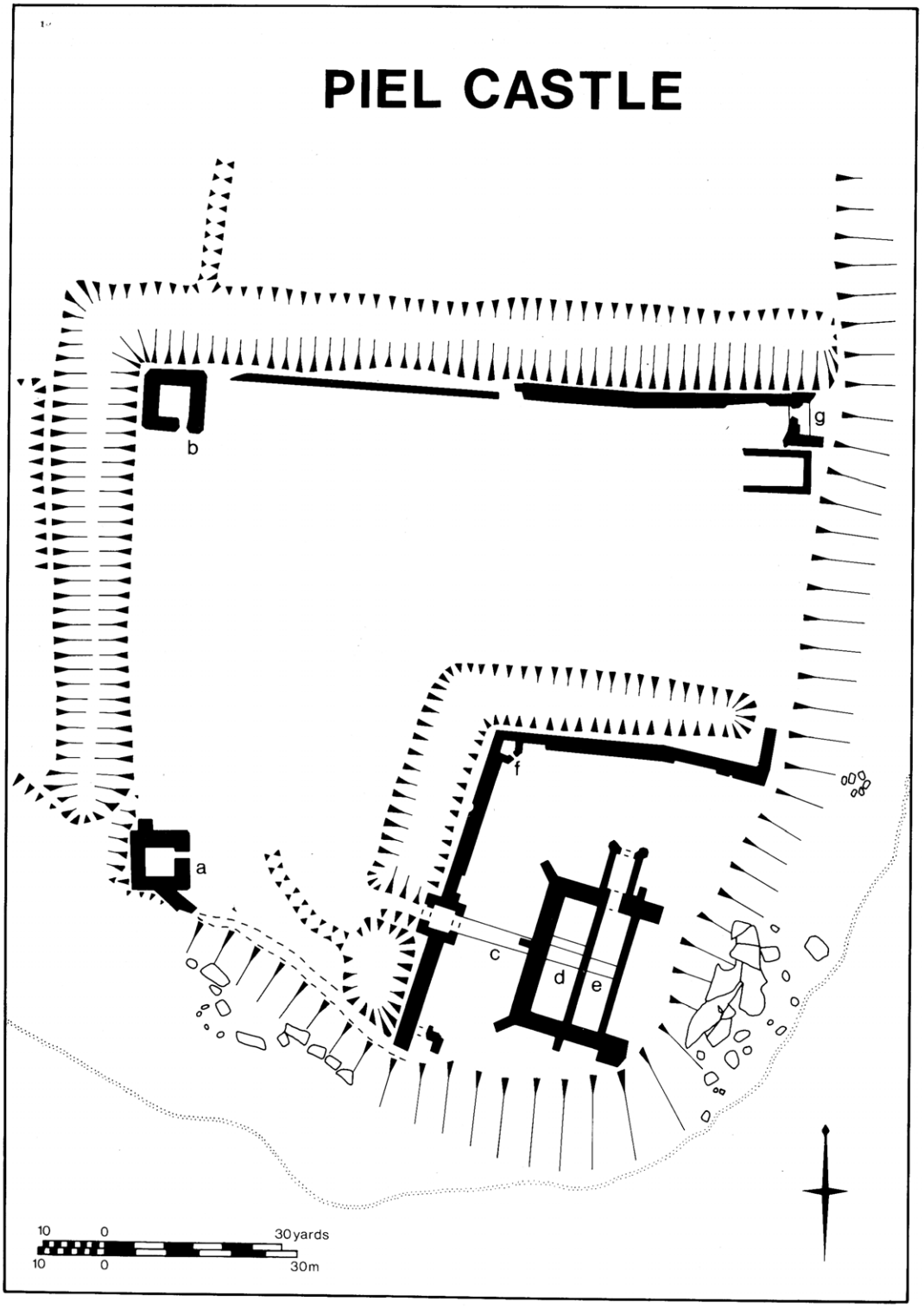

Fig. 2. – The plan of the Castle.

flush with the surface of the tower. The south-western tower seems contemporary with the short stub of curtain wall extending to its north but it is clearly later than the remaining section of curtain wall to the south-east, where a clear break in building is visible, sloping down towards the tower. Despite this evidence for a structural sequence, it is unlikely that construction took a long time.

The outer north-eastern tower projects slightly north of the curtain wall but there is no clear evidence to suggest that it is an addition. The parapet of the curtain wall has been raised to protect a staircase giving access to the roof of the tower but there is a clear break between the curtain walls and their parapets in all areas of the castle. The masonry of this tower seems in general to be more carefully finished than the other outer towers, possibly indicating a differing function. It stands on a plinth of red sandstone ashlar and its doorway, clearly once chamfered, was of a pattern similar to the doorway into the small inner north-western tower. The only other structure built on a plinth is the keep. No obvious point of entry into the outer bailey survives and the theory has been put forward (Curwen, 282) that it was immediately to the east of this tower, although the erosion of the island at this point and the resulting collapse of much of the tower does not permit this hypothesis to be tested. The tower is supported by a diagonal buttress at its south-western corner, now very much decayed. This was necessitated by its unstable foundations, which were laid on the upcast from the moat. Its west wall contains two blocked openings that seem to have been windows, one on either floor. The internal blocking is substantial but the external blocking is harder to see. The windows were probably widely splayed internally but they still seem larger than those seen in other towers. On its external face, the lower blocking contains the base of a narrow window surround in the bottom corner. If this is a portion of the masonry of the window in position, it may reveal the size of the opening, but it is more likely to be part of the blocking.

The Inner Curtain

Slight diagonal cracks are visible on the western face of the inner curtain on either side of the gatehouse, sloping down towards the gatehouse foundations. These seem to represent a building break before the insertion of the gatehouse but the evidence in its interior apparently contradicts this, as the internal faces of both the north and south walls bear marks of patching, very similar to the profile of the curtain wall. The construction method of the patched areas is also not consistent with the rest of the structure but it seems unlikely that they represent the broken ends of the curtain wall through which the gatehouse was inserted; they may have been necessitated by subsidence in the structure.

The three surviving corner towers to the inner bailey are undoubtedly later additions. The south-western tower utilizes the curtain as its western ground floor wall. The upper storey of this wall and the other walls of the tower are narrower. The shelf created by the curtain wall walk could thus be used as a support for the first floor joists. The north-eastern tower is unusual in that it projects north of the curtain and the inner moat terminates just west of it. This may suggest that the tower was always close to the edge of the island, but it may also hint at a radical change of plan during the occupation of the castle. If the entrance to the outer ward was at the north-eastern corner, the original

plan may have anticipated an entrance to the inner ward in the same position, a design later found to be untenable due to the rate of erosion on that side of the island. Unfortunately, the surviving fragments of this tower do not permit the hypothesis to be tested. The lower part of its south wall is formed by the curtain wall and it seems that again, a narrower upper storey was built over it when the tower was constructed. Only a small fragment of this wall remains, however, because the rest has fallen into the sea.

The inner north-western tower differs in size and shape from all the others, being much smaller and pentagonal. It utilizes the north-western corner of the inner curtain for two of its ground floor walls, with narrower upper walls clearly added. The additional southern and eastern walls are also narrower. Here, too, the tops of the wider walls were used as a support for the floor level. The eastern wall is built over the lowest steps leading to the rampart walk (see below, excavations). The ground floor chamber has no windows and can have acted as little more than a sentry box.

The Keep

The use of mixed rubble as the constructional material for the castle makes the identification of its phasing, and any patching, extremely difficult, but despite this, it is apparent that the design of the keep changed during its occupation. It is likely that, as originally planned, its main entrance lay on the north side into the central one of three compartments, possibly through a gatehouse. It also had diagonal buttresses at the corners (see print by T. Hearne, 1781, reproduced in Curwen) and an attached tower at the south-eastern corner. Tourelles seem to have been placed at each of the corners of the roof, with the probable exception of the south-eastern corner, and there were also two stair turrets in the end walls above the central compartment. During construction, the walls were strengthened with the addition of further buttresses (see below, excavations).

The gatehouse may be contemporary with the rest of the keep but it does not seem to be integral with the original design. Definitive phasing here, however, is virtually impossible, for the joining walls of the keep and the gatehouse appear to be alternately bonded and butted in short vertical sections, a technique found elsewhere in the castle. The eastern side of the gatehouse has been constructed close to a buttress supporting the intramural newel stair in the north wall. A small window in the ground floor wall of the keep between these two projections is therefore rendered effectively useless, both for lighting and defensive purposes. The wall above the gateway into the keep is composed of red sandstone ashlar of irregular size, laid in uneven courses. This, however, is confined to the area of the intramural chamber which held the machinery for the portcullis. Areas of red sandstone in the walls of the keep mark the location of intramural staircases, although smaller intramural passages have not been marked in this fashion.

Key to illustrations of Keep Gatehouse and West Elevation

B	Blocking: blocked putlock holes; windows; partial blocking of Keep Gateway	R	Stone replacement by the Duke of Buccleuch (1876-8)
C	Cement	S	Stringcourse
D	Drain	T	Tracery
E	Erosion/Weathering	W	Windows
F	Exposed foundation	▒	Red sandstone highlighting architectural features
L	Building lift		
P	Putlock hole	▒	Facing eroded

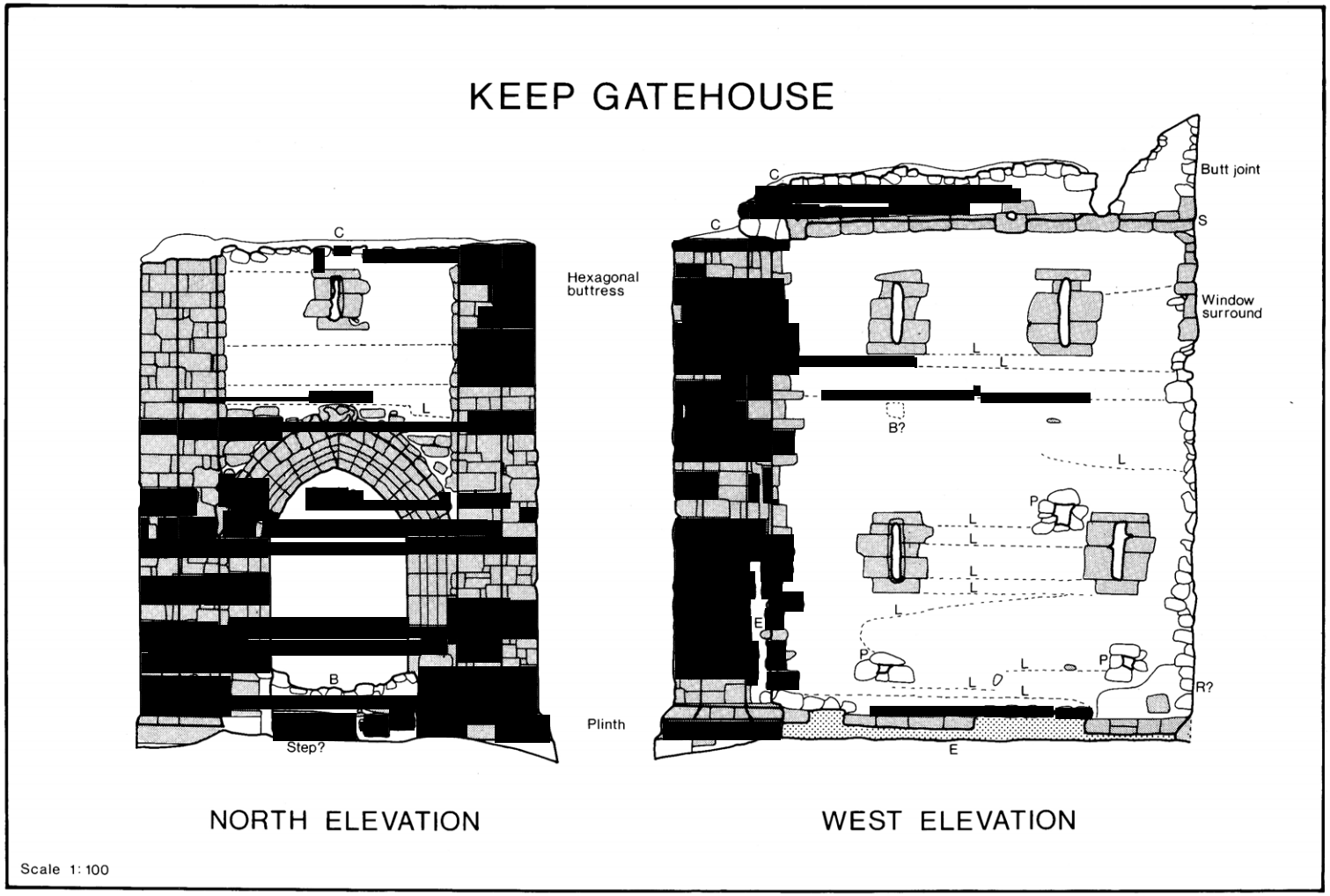

Fig. 3. – Survey elevation of the Keep Gatehouse.

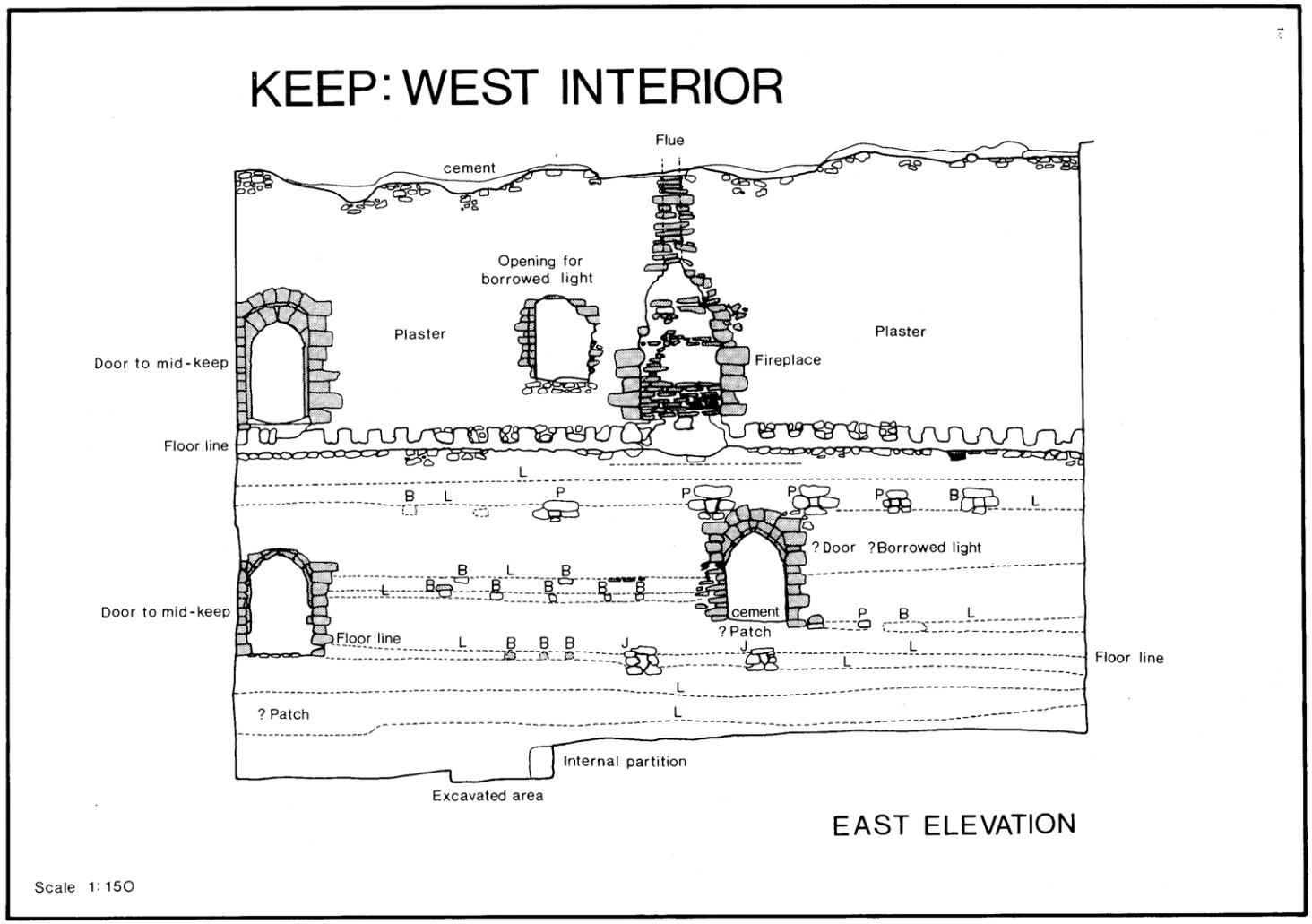

Fig. 4. – Survey elevation of the eastern wall of the west compartment in the Keep.

The original entrance through the gatehouse was into the ground floor of the central chamber of the keep. The gatehouse had gate-arches at either end and the lower part of the entrance passage has been blocked beneath each gate-arch, thus raising the entrance to first floor level. The blocking is crude in comparison with the masonry in the rest of the keep, yet it seems likely that it was constructed during the occupancy of the castle. The portcullis slots terminate, by design, at the top of the blocking, in flat pieces of red sandstone. It seems that the head of each arch has simply been raised to the new level and the jambs rebuilt to the required height, since elements of the uprights continue below the level of the blocking and are incorporated in it. In its final form the entrance to the keep was through a two-storey gatehouse into the first floor level of the central compartment of the keep. Both gate-arches in this final phase have portcullis slots and the keystone of the outer arch was decorated with a dancing figure.

The internal design of the compartments of the keep suggests that the ground floor was of little importance and that the main chambers were on the first and second floors of the western compartment. This would make an entrance into the first floor logical and yet the original entrance was clearly into the ground floor. This seems to have acted as a basement in its final form, the only surviving access to it then being, unusually, from the second floor of the western compartment. This lack of easy access adds weight to the belief that the functions of the various internal elements of the keep must have changed during the occupation of the castle, as the present ground floor levels would not allow anyone to stand upright.

All the extant architectural features relate to floor levels defined by rows of joist holes but there is some slight evidence that the second floor level in the central compartment was higher: each long, load-bearing wall has a number of regularly spaced holes immediately above the scar left by the removal of the second floor joists associated with architectural features and there is a further set of large holes, some 2·5 m lower down, midway up the first floor. The holes perhaps indicate that there was a major refurbishment of the keep at some stage, a fact which would also account for the number of bands of putlock holes, resulting from scaffolding, in the walls of the central and western compartments. They seem to be too large for putlock holes, although, if they do represent earlier joist holes, it is strange that they have not been blocked during subsequent rebuilding; furthermore if the floor levels were changed the window arrangement would also have had to have been reorganized totally and there is no evidence for this externally. If the floor levels were in fact changed, the ground floor of the original scheme would appear to have been of greater importance, with low first floor chambers probably acting as little more than passages.

The windows in the first and second floor walls of the keep are large, and most contain some remains of tracery. There is a reference to the survival of glass from the castle until 1876, when it was loaned to the Barrow Yacht Club (C.R.O., Barrow, BD/BUC Box 3, letters). Despite the fact that the internal architectural details suggest that the living accommodation was on these floors, most of the first floor windows in the central and west compartments were blocked, probably within the medieval period. The blocking consists of a mixture of local stones and chips of red sandstone, laid in rough courses. The southern window of the western compartment contains the head of a small single light within the blocking. The northern window in the first floor of the eastern compartment is blocked and the wall subsequently sheared down the plane of this

window when the eastern side of the compartment collapsed. This makes it certain that the blocking took place before the restoration work of the Duke of Buccleuch, since the wall had collapsed before he began his work on the sea defences in 1854.

There is only one documentary reference to a possible refurbishment of the castle. The escheator of the County of Lancaster claimed that the abbot of Furness, John de Bolton, had thrown down and annulled the "pele of Fotheray" in 1403, as he found that the cost of keeping it in repair and garrisoning it beyond his means (County Palatine of Lancaster Chancery Rolls, 5 Henry IV, No. 14). The claim was subsequently dismissed by the king, but it is likely that some repair work would have resulted.

The "Chapel"

There is a single free-standing building in the outer bailey, traditionally referred to as the "chapel", because of an internal rectangular platform at its eastern end. However, it differs markedly from all other structures within the fortified area and it is likely to have been constructed late in the sequence, possibly even after the end of the occupation of the main buildings. It contains a large quantity of small chips of red sandstone and the local stones used seem smaller than usual. The eastern end stands on a plinth and contains a string-course, seen elsewhere only in the keep, but the other walls are roughly constructed. The structure seems to have been built into the upcast from the moat on which the outer north-eastern tower is situated. Much of the northern side is masked by this and also by debris from the tower. A piece of masonry projects from the southern wall of the tower over the north-eastern corner of the structure. This is decayed but appears to be part of the core of an arch. If this is so, it would have been difficult for the tower and the building to have been in use at the same time. There is a reference to a barn and a bakehouse in 1839 (BD/BUC Boxes 21 and 45, Bundle 22) in association with a grant of land "within the castle yard", although it does not state specifically that the buildings were within the yard area. It may be that this structure relates to this obviously post-medieval activity.

THE EXCAVATIONS

Excavations took place at selected points within the castle, with the aim of establishing whether any important archaeological levels would be disturbed by the proposed programme of consolidation and repairs (see Fig. 2).

The Keep (Fig. 2d, e,)

A trench was laid across the centre of each of the surviving compartments of the keep and extended through the inner bailey and inner bailey gatehouse. This demonstrated that the keep stood on a raised area of boulder clay that sloped fairly steeply away to the west. The mound had been emphasized when the keep was constructed, by throwing up a bank, presumably formed by upcast from the lower-lying inner bailey, against the slope of the raised area and the foundations of the keep. This upcast had partly slipped, masking the sudden break of slope. The interior walls, and the interior face of the western wall, demonstrated no apparent change at ground level, but the outer face of

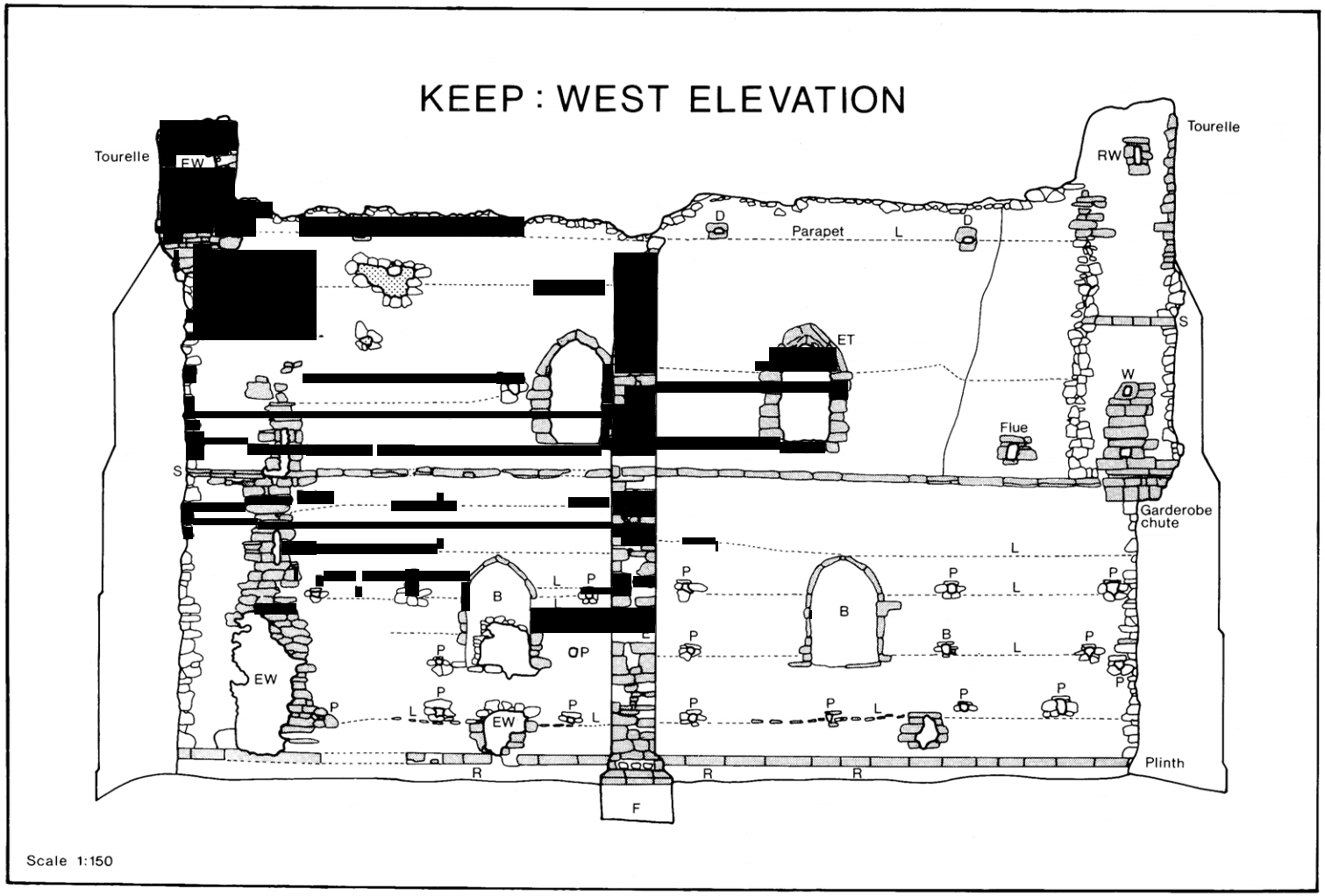

Fig. 5. – Survey elevation of the western external wall of the Keep.

the western wall clearly had stepped foundations a little way below its red sandstone plinth. These foundations had been built within a narrow construction trench, visible only on the inner side of the wall. The base of the plinth seemed to denote the medieval ground level. A small deposit of sand and mortar, which appeared to be the detritus left by masons when finishing the pointing of the wall, was found to lie around the exterior foundations of the keep.

The original plan of the keep had evidently been changed during its construction, as a buttress had been added to the centre of the western elevation. This seems in fact, to have occurred during the construction of the building, as, although the buttress cut through the upcast and there were traces of a slight break in the foundations between it and the wall, the buttress had become an integral part of the design above the medieval ground surface. This addition does not seem to have altered the plan of the upper storeys, since the insertion of the buttress has constricted, rather than displaced, the northern window on the second floor. The buttress had an outwardly sloping rubble foundation, bonded by sand mortar, and presumably once covered by more banking, but this had slumped down the slope, leaving only a thin cover of modern topsoil.

Within the walls of the keep, sand had been spread to level up the ground. The only trace of flooring, however, was a thin layer of mortar, sand and chips of red sandstone in the central compartment which seems to have been laid as a foundation for a floor. There were no material traces of medieval occupation remaining in either of the surviving compartments of the keep, and this leads to the conclusion that either the occupation of the keep was never intense, or that the keep had been cleared out rigorously at some stage in its history. A combination of these two possibilities may be close to the truth, since it is likely that the ground floor of the keep was used only as a store and that restoration work by the Duke of Buccleuch was concentrated on this part of the castle.

Before excavation there was a distinct difference in ground level within the western compartment, the northern part being almost 0·5 m, lower than the southern. The differing ground levels were separated by a low retaining wall. On excavation, modern material was found lying on the sand levelling layer to the north of this wall, and this suggests that this area was completely cleared during the restoration. A great depth of material was found to the south, presumably the soil removed from the northern area. This soil had built up to such an extent that it would have been impossible to stand upright in the chamber if the floor above had still been in place. It was impossible to date the wall which separated these two areas. It was not bonded with either wall of the compartment, and lay over the sand levelling layer. No trace of any actual floor survived in this compartment, but it seems likely that the wall was not inserted until after any such flooring had been removed or had decayed. The fact that there is no access through the wall and therefore no obvious way into the southern sub-compartment supports the opinion that the wall was the work of the 19th century restorers.

The Inner Bailey (Fig. 2c)

There was no trace of a metalled roadway in the inner bailey between the gatehouse to the keep and the gateway to the bailey. All that could be defined was what appeared to be a presumably medieval ground surface, covered with a scatter of masons' chippings. Within the inner bailey gateway itself, the surface beneath the inner arch consisted of

small cobbles set in a bed of sandy mortar, and this seemed once to have had a mortar skim over the top. This has since been eroded, apart from a lip against the walls. It is probable that the ground floor surface of the gatehouse otherwise consisted of wood, laid on a foundation of large rounded stones set in the natural boulder clay. One of the pivot holes for the drawbridge remained, as did part of the abutment on which it rested when down. The moat in front of the gatehouse has now been infilled with gravel to form a permanent causeway. A fan-shaped spill of silt, spreading out from the mouth of the gatehouse and partially covering the foundations of its western wall, lay beneath this deposited gravel. These foundations were very uneven in quality, those to the south-west being neatly laid in uneven courses projecting out from the wall in a skirt, whereas those to the north-west comprised merely a jumble of small stones in a rough bed of mortar. The medieval ground surface on this northern side must have been lower than that to the south, as the red sandstone quoins on the north-western corner extend below the projected level of the southern foundations.

The Inner North-west Tower (Fig. 2f)

The excavation of the interior of the small north-western tower of the inner bailey proved that this structure was an addition to the original plan of the castle. It was found that the tower had been built over the foundations of the curtain wall and the bottom steps of a staircase up to the rampart walk. The curtain walls do not meet at right angles here and this may partly explain the unusual shape of the building. The banking around the keep left little room for any large vehicles to negotiate the route to the entrance to the keep. The addition of a south-eastern wall to form a pentagonal structure may have taken this lack of space into account. The foundations of the curtain wall were found to be extremely wide, those for the western wall projecting up to 0·6 m. The foundations of the northern wall project more than 1 m; the extra width of these foundations is caused by a staircase to the rampart walk having been constructed in the thickness of the wall at this point.

The floor of the tower was laid immediately on top of the bottom step of the stairs to the rampart and the foundations of the curtain wall. The area below this floor had been levelled by the dumping of brown clayey sand over the foundation trenches for the curtain wall and the tower and also over a remaining area of old ground surface inside the door of the tower. The floor consisted of a mortar spread, which now survives only in slight patches above the western foundations. A further foundation layer of mixed clay and sand had been spread over this, which supported two layers of mortar, one immediately above the other. Both seem to have acted as floor-surfaces. Another floor was situated considerably higher than the others, and it seems that this must denote more than a simple repairing, as the raising of the floor required the raising of the entrance passage as well, making the doorway much smaller. All the floor levels survived only as a series of patches clinging to the walls, both in the tower and in the entrance passage.

A linear feature comprising a series of unworked rounded local stones bonded by sandy mortar lay beneath the wide construction trench for the curtain wall. This feature seemed to emerge from beneath the northern curtain wall and to disappear beneath the southern wall of the tower towards the western curtain wall. The most likely explanation

for such a feature would be a drain, but its purpose in this part of this castle is obscure. Alternatively, it could represent the remains of an earlier period of building on the site, although there is no other archaeological evidence to suggest this.

The Outer Bailey (Fig. 2a, b, g)

All three surviving corner towers of the outer bailey curtain wall were partly excavated. The north-western and south-western towers have survived well and all their walls, varying in height between 5·5 m and 9 m, are still standing, sometimes almost to roof level. The interiors of both of these towers were half-sectioned and the walls were found to have been built directly into the natural boulder clay. The construction trenches for the walls were irregular and the wall foundations consisted of unworked stones thrown into the trench, with mortar and clay packing them. Little trace of floor levels remained, though it was possible to establish that there was a mortar floor in the north-western tower and a beaten clay floor in the south-western one. Both these towers had mortared entrance ways, over stone foundations. The north-western tower, in particular, appeared to have suffered from relatively recent activity, as several large pits containing modern material had been dug through its floor. It seems likely that at least one set of pits is associated with the restoration work of the Duke of Buccleuch, since they had been dug along the south wall, and matched the foundations in depth, as though they had been dug in order to examine these foundations. Here, also, a large worked stone had been inserted at right-angles into the foundations, presumably to underpin the wall, which has cracked above this area.

It seems that the area around the north-eastern tower was known to be less stable than other parts of the castle, as the curtain wall foundations, made visible by the collapse of the wall above due to the erosion of the island, seem to be stepped down towards the present edge of the low cliff and those of the tower seem deeper than elsewhere on the site. This is due partly, no doubt, to the difficulty of the engineering operations necessitated by the sharp drop in ground levels to the south of the curtain wall and the fact that the tower seems to have been constructed on the upcast from the moat.

Much of the tower has fallen into the sea but the surviving interior was excavated, as was the entrance and the area immediately outside it. The whole area proved to have been filled, in places to a depth of 1 m, with a mass of rubble, possibly from the collapsed walls of the tower. The rubble seemed to have been deliberately deposited, however, as it was densely packed, yet no stones were mortared together, as would be expected if this were simply a collapsed wall. There was no dating evidence from this back-filling, apart from some modern material at the very top relating to the restoration activities of the Duke of Buccleuch. It may be, therefore, that this tower became unstable and fell out of use at a relatively early period in the history of the castle, and was partially backfilled to prevent further collapse.

Dark boulder clay, lying beneath the rubble both inside and outside the tower, was probably the natural subsoil. Inside the tower, however, the amount of small stones on the surface suggested that either it had been utilized as a floor or, at the very least, had been considerably trampled during the construction of the building. Narrow strips of mortar containing small stones along the northern and southern internal faces, the northern one more than 0.2 m higher than the southern one, seemed to represent the top

of the foundations of each wall. They lay immediately below two blocks of ashlared red sandstone built into the two surviving corners of the tower, which seem to be the guidelines set by a master mason during the construction of the tower.

The internally splayed entrance passage is considerably higher than either of the mortar strips, which suggests that the floor of this tower was of wood and has completely disappeared. The floor of the passage comprised small stones set in a base of soft sandy mortar, with a skim of mortar over the top which now only survived along the northern wall. At this level, there was a plinth of well-worked red sandstone along the outer wall of the tower. This formed a step into the tower. The plinth was continued along the interior of the curtain wall by a thick lip of mortar, the bottom of which seems to denote the level of the old ground surface. There was a narrow construction trench along the western edge of the plinth, filled with mixed clay, mortar and small stones.

Restoration Work by the Duke of Buccleuch

There is little documented evidence for the restoration work carried out by the Duke of Buccleuch between 1876-8. The Accounts of the Liberty of Furness (BD/BUC Box 30) are unspecific about the work, apart from one reference to a bill for "freestone steps for the winding staircase" in August 1876. This must refer to the obvious repair of the newel staircase from the keep gatehouse to the top of the building. The survey and excavation highlighted the fact that the restoration was far more comprehensive than had previously been thought and encompassed all elements of the castle. The most obvious renovations are the replacement of red sandstone ashlar quoins and stones forming the plinths, all of which are easily accessible. Three of the six doorways from the turrets on the top of the keep are clearly good modern copies and other doorways and window surrounds in the keep have also been replaced. The decayed remains of the joist holes of the first floor in the keep compartments have been sealed and the small retaining wall in the western compartment, examined in the excavations, may well have been constructed to hold back the debris from the partially cleared compartment. The demonstrably major repair work that took place in the keep may have produced some of the open putlock holes seen in great profusion in this building. The tops of most walls have been sealed with concrete to prevent further decay and a floor level seems to have been placed in the south-eastern turret of the keep, which was originally a stairwell, to prevent access to dangerous areas. The vaulted ceiling of the north-eastern turret may also have been replaced, as there are traces of decayed stairs winding up the side of the wall. The original design of this part of the structure is therefore unclear. The staircase up to the top of the gatehouse of the inner bailey was repaired and a roof walk was constructed around the top. An attempt was made to stabilize the south side of the collapsed doorway in the outer north-eastern tower and the south wall of the outer north-west tower may also have been bolstered at this time.

The history of Piel Castle remains somewhat obscure and fragmentary, despite the excavations and survey. The excavations produced very few remains of medieval occupation but they did show that there was more than one building phase, and that the design of the building was altered during the occupation of the site. This was confirmed by the fabric survey. The lack of occupational material seems to be due to the renovations

of the Duke of Buccleuch but the general impression gained is that the castle was never intensively inhabited. The restoration work under the direction of the Duke was obviously far more comprehensive than previously supposed and greatly contributed to the survival of the castle. This has been thoroughly documented for the first time. The project produced a much clearer picture of the complexity of the site whilst demonstrating the problems in phasing inherent in a structure constructed of mixed stones from a local source.

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