

THE WESTERN ENTRANCE TO THE TOWER OF LONDON, 1240–1241

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SUMMARY

The discovery in 1995 of a medieval structure within the fill of the Tower's western moat, close to the outer curtain wall and roughly half way along it, led to further fieldwork in 1996 and 1997. This revealed a masonry platform, roughly 7m square, orientated on an approximate north-south axis. The eastern side was built into a bank of clay, the other three were faced in Reigate and Purbeck marble ashlar, set within a massive timber frame, which was linked to further framing to the west. The masonry and timberwork were both distorted by subsidence, an area of piling against the platform's eastern side having been driven in to stabilise the platform after the collapse of its superstructure. The masonry was of late 12th or 13th-century type, but dendrochronological dating of the piles to 1240 may offer the precise date of its shoring up, probably its collapse, and possibly its construction. The coincidence of the building's position, its approximate date, the exact date of the piles and its structural failure almost certainly identify it with part of Henry III's new defences which, according to Matthew Paris, fell 'as if struck by an earthquake' in 1240 and 1241. The nature of the structure, its position, and the interpretation of the timber structure as a bridge identify it as a gate tower – probably an outer barbican. While the exact chronology of building, collapse and consolidation remain to be confirmed – together with the interpretation of Matthew Paris's text – the discovery vindicates Sir Howard Colvin's suggestion in 1963 that the principal entrance to the Tower in the mid 13th century was in this position. In addition, it has interesting implications for the form of the castle before the 1240s, in the period 1240-c.1280, and for the sequence and extent of Edward I's refortification.

INTRODUCTION

In June 1995 a surprising find was made deep within the Victorian fill of the Tower of London

Moat: a trial pit opened as part of an archaeological evaluation exercise in support of the Tower Environs Scheme,¹ brought to light the corner of a masonry structure, elegantly faced in alternating courses of Reigate stone and Purbeck marble (Feature 2954). The form of the structure could only be guessed at, but it was tentatively attributed to the late 12th or the 13th century. It was also noticed that the structure was not horizontal, but sloped from west to east at an alarming angle. The find was entirely unexpected: there was no reason to think that any structure would be encountered in an area within the moat which was assumed to have been excavated from scratch by Edward I in the 1270s and 1280s. Its identity was a mystery, although one thing was immediately clear – the feature cannot have been contemporary with, or later than, the curtain wall behind it, as it could have had no imaginable function while this existed. The inference was that it belonged to an earlier building campaign – the most probable, given the received history of the castle, being one of Henry III's. A link was swiftly made between the feature – apparently of the right date and clearly subject to some sort of structural failure – and Matthew Paris's well-known account of the collapses of 1240 and 1241, respectively of a 'noble gateway...together with its forebuildings and outworks', and of the 'same walls...together with their outworks and fortifications' (*Chronica Majora* IV, 93 and 95). Further excavation and research has tended to confirm this attribution, although some fundamental questions and many points of detail remain unanswered.

This article has four aims: firstly to describe the remains, their context and internal dating

evidence; secondly, to make an attempt at identification in the light of Matthew Paris's account and other documentary material; thirdly to consider the original form of the building and the complex it belonged to, and finally to assess the implications that this, and some associated discoveries, may have for our understanding of the castle's layout and evolution in the 13th century.

CONTEXT AND DESCRIPTION

The Tower of London moat

Before describing Feature 2954 in detail, it may be useful to summarise its context within the development of the Tower and the history of the existing moat, beginning with a summary of what is known of its late 12th and early 13th-century precursors on this side of the castle. The first was the creation of Richard I's chancellor, Bishop Longchamp, who, according to Roger of Howden 'caused the Tower of London to be surrounded with a moat of great depth' in 1190.² A variety of evidence has shown that Longchamp's western rampart ran northwards from the Bell Tower – the only part of his work to survive – probably following an alignment which had existed since c.1100 (Colvin 1963, 708, fig 60); the western moat washed the Bell Tower and can be assumed to have continued northwards along, or close to, the foot of the wall.³ Of more immediate relevance are the nature and progress of Henry III's improvements. These have been outlined by Colvin in the *History of the King's Works* (Colvin 1963, II, 710–715) and need no lengthy explanation here: in short, new walls were put up on a new alignment to the north and east, taking in St Peter's Church and land outside the Roman wall, defining an area now known as the Inner Ward; at least the alignment of the 12th-century western rampart was retained, and the western moat enlarged, but the remainder was backfilled and a new moat dug around the entire landward circuit of the new defences. The work was carried out between 1238 and the 1250s, although the new curtain walls seem not to have been completed. All but the southern arm of the existing Tower moat was created, along with the outer ward, St Thomas's tower and the existing western entrance, by Edward I, between 1275 and 1280. Once again the essentials of the story, known largely from the Pipe Rolls, have been amply covered by Colvin (1963, 715–23); work seems to have begun in May 1275, when

expenditure of over £90 was recorded 'for making the great ditch around the said Tower from the Thames towards the city to the Thames by St Katherine's hospital' (*ibid* II, 716).⁴ The earliest measured plan of the Tower, Haiward and Gascoyne's celebrated *plan cavalier* of 1597 (Parnell 1993, 56, fig 36; Impey & Keevill 1997, 23, fig 20) probably gives a good impression of the landward moat and the entrance routes across it as Edward I left them.⁵

The moat owes its existing form largely to six later operations. The first, carried out piecemeal between the late 13th century and 1391 (Colvin 1963, II, 726–7; Priestley 1996; Impey & Keevill 1997, 18), was the creation of the river wharf (and therefore the south moat). The second, in 1670–83, was the realignment and revetting of its outer edge to the design of the Chief Ordnance Engineer, Sir Bernard de Gomme – the rump of a much larger scheme to completely re-fortify the castle;⁶ the third, begun in 1670 but completed in 1753, was the infilling of the Lion Tower moat. The fourth and most important, the draining and infilling of the moat in 1843–5, deserves a bit more explanation. From the 1290s onwards the Tower moat had been difficult to maintain, as a result of silting from the river, pollution from the City ditch, and the dumping of sewage and rubbish both from the castle and the City. By the early 19th century the problem was both worse than ever and more obvious, as the general standard of metropolitan sanitation improved. Drastic attempts were made in 1830–2 to clean out the moat, but these were largely a failure, and in the early 1840s a series of medical reports blaming the moat for the garrison's ill-health persuaded the Constable, the Duke of Wellington, to 'convert the moat into a dry ditch and to build sewers therein to receive the soil and surface drainage' (WO 44/614). Work began in Spring 1843 with drainage works and the laying of a massive brick culvert round all four sides of the castle, swiftly followed by backfilling. The fill itself contained building rubble, including remnants of the 17th-century Grand Storehouse, but was largely made up of clay-rich soils from riverine sites – perhaps from dock excavations in the East End. By the end of 1845 the operation was complete (Impey & Keevill 1997, 18–33). The fifth intervention was the late 19th-century construction of Tower Bridge and its approach road,⁷ planted in the fills of the eastern moat. The final major alteration took place in 1936–8 with the excavation of the area immediately to

the north of the Middle Tower, leaving part of the Lion Tower, its moat, and its associated causeways exposed to view.⁸

Feature 2954: situation and context

Trench 27, which completely revealed the principal feature under discussion, the ‘masonry platform’ (Feature 2954), was laid out across the middle section of the west moat (Fig 1). One of a total of 59 trenches or trial pits excavated during the 1996 and 1997 seasons, this was by far the largest and archaeologically most complicated. Its dimensions at ground level were 38m × 18m, but the depth of the excavation required stepped shoring to the edges, considerably reducing the area studied at the lowest and most interesting levels. It was also limited by intrusive features such as the 19th-century culvert, pipes and inspection pits, as well as by the need to preserve the structural finds themselves *in situ*. The masonry platform was encountered 2.5m below turf level, its highest point rising to 0.24m above Ordnance Datum. The main part of the structure consisted essentially of a rectangular masonry platform, aligned on an approximate east-west axis. Its position may be most usefully described in relation to upstanding medieval and other features: the western edge of the ‘platform’ lies at a maximum of c.10m from the outer curtain wall, c.28.5m from the inner wall; its northern edge lies 80m north of the south-western entrance causeway (Fig 1). It is nearly, but not quite, at right-angles to the Edwardian wall (its west face diverging by about 4 degrees), so that its position, although not its axis, is aligned squarely with Great Tower Street, while the Beauchamp Tower lies not immediately behind it but about 10m to the south.

The masonry structure itself consisted of a core of mortared Kentish ragstone rubble, faced with ashlar on the southern, western and eastern sides. Four courses survived around all three edges, the lowest being of Purbeck marble slabs as much as 1.50m long, projecting 100mm from the face immediately above and finished in a 45-degree chamfer. Seated on this were two further courses of Purbeck marble ashlar, above which lay the fourth and final course to survive complete, composed of finely-cut Reigate slabs finished with a second 45-degree chamfer. Most of the exposed joints had been cramped, although

only the sockets and lead seating remained. In at least one place the blocks were bonded with lead. Except where subject to physical damage, the fine vertical tooling of the dressed surfaces was perfectly preserved. No masons’ marks were observed. The high quality of the construction was in marked contrast to the foundations, which consisted of no more than a shallow raft of rubble and gravel laid directly on the London clay, without the benefit of piles.

The square ashlar-faced platform was not found in isolation. The rubble core not only extended as much as 3m beyond the western limit of the platform but projected beyond its northern and southern faces; the western stubs of these returns were faced in ashlar, coursed, bonded and quite clearly contemporary with the main structure, and of the same cramped construction. The chamfer to the top course carried round onto the returns, but the lower one did not. The returns retained roughly equal areas of facing, the lowest courses projecting as much as 0.60m from the face, above which further blocks, anchored in the main structure, remained in place. The diminishing length of the blocks revealed their upper surfaces complete with cramp sockets: it can be assumed that the cramps, like the missing masonry, had been salvaged.

Piling behind the platform

Behind the east side of the masonry platform, and apparently shoring it up, was an irregular area of close-set beechwood piles, driven in at an angle. Anaerobic conditions had preserved them and their bark almost perfectly, although much of the wood was very soft and there had been some physical erosion to the exposed tops. Twenty dendrochronological samples were taken by Ian Tyers, all of which returned felling dates to the winter of 1240 (Ian Tyers pers comm).

The timber structure

Surrounding the three main faces of the platform, and extending westwards from it, were elements of a massive timber structure (Figs 2 and 3). Hard against the northern and southern flanks of the stonework were squared timbers (quartered oaks), their eastern ends built into the returns at either side – leaving no doubt that the masonry

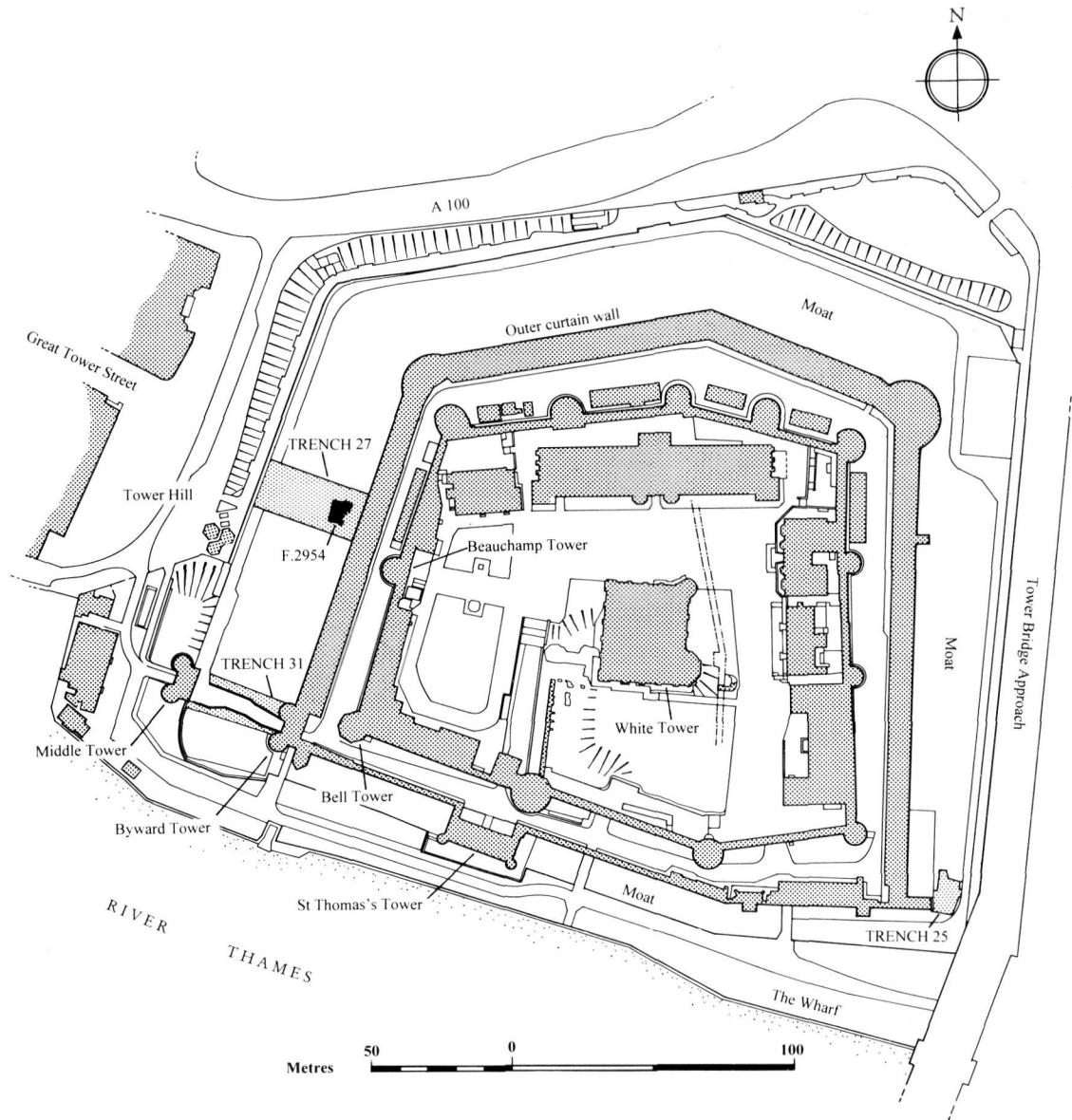


Fig 1. Plan of the Tower of London and immediate surroundings, showing the location of the trenches excavated 1995–7, the position of Feature 2954, and parts of the Tower and other features mentioned in the text (Edward Impey)

and timber structures were assembled at the same time. The upper surface of the timbers, if originally level, would have lain 150mm below the lower chamfer, level with the very lowest course of ashlar. Mortices in the outer flanks of both timbers at their extreme east ends show that they may have been adjoined at right-angles by further timbers (aligned with the masonry returns), but these were probably never fitted, as

there are no traces of the damage which their extraction would have caused. The western ends of the flanking timbers were tenoned into a north-south beam 8.95 long and of the same scantling running along the west face of the platform (Fig 3C), completing a frame around three sides of the structure; the joint to the north, double pegged, remained intact, but at the south end the upper surface of the timber had been



Fig 2. Trench 27 viewed from the parapet of the outer curtain wall in October 1996, towards the end of the excavation. In the foreground (east) is Feature 2954 and associated piling; a contemporary timber structure can be seen surrounding it and extending intact to the west. Some of the scattered timbers beyond were part of the framed structure – but others, unconverted beech trunks – may have been used in building work or incorporated in a temporary bridge. The massive round-backed feature crossing the trench is the culvert built during the backfilling of 1843–45 (Oxford Archaeological Unit)

scraped away, probably during one of the many scouring operations before 1843, leaving the tenon exposed. Four further timbers, varying from 250mm to 300mm scantling, and set at 1.8m intervals, were jointed to the west side of the north-south timber (Fig 3C); a broken-open mortice at the extreme south end of timber C reveals the former presence of a fifth, possibly removed during the building of the mid 19th-century brick culvert. The western ends of the four shorter timbers are tenoned into a second north-south timber (D), of the same scantling as C, creating, as built, a box-frame of four compartments. Each compartment was found to be packed with rubble, bound in a mortar-like matrix.

The single west-facing joint in the second north-south timber (D) was found towards its north end, and took the form of a mortice, cut at an angle suggesting that it housed a raking timber pointing north-west. Adjacent to this

point, but not attached to it, were found two smaller timbers (F and G), evidently used or intended as diagonal braces, as both of them, although both broken off, had butts cut at an approximately 45° angle bearing skewed tenons. One of these (G) had been housed in the skewed mortice in the main north-south timber (D), as is shown by the match between the broken-off tenon still attached to timber G and the fragment still pegged into the mortice.

Further to the west by about 2.5m was found a third major timber (E), of the same scantling as the others (*c.* 300 × 300mm). This was found aligned approximately north-south, suggesting – although this could not be proven – that it had originally been parallel to the others and had some structural relationship to them. At this point the plot thickens, as the west face of the timber has five mortices of the same type and scale, and at the same intervals, as those housing the cross-members between timbers C and D.

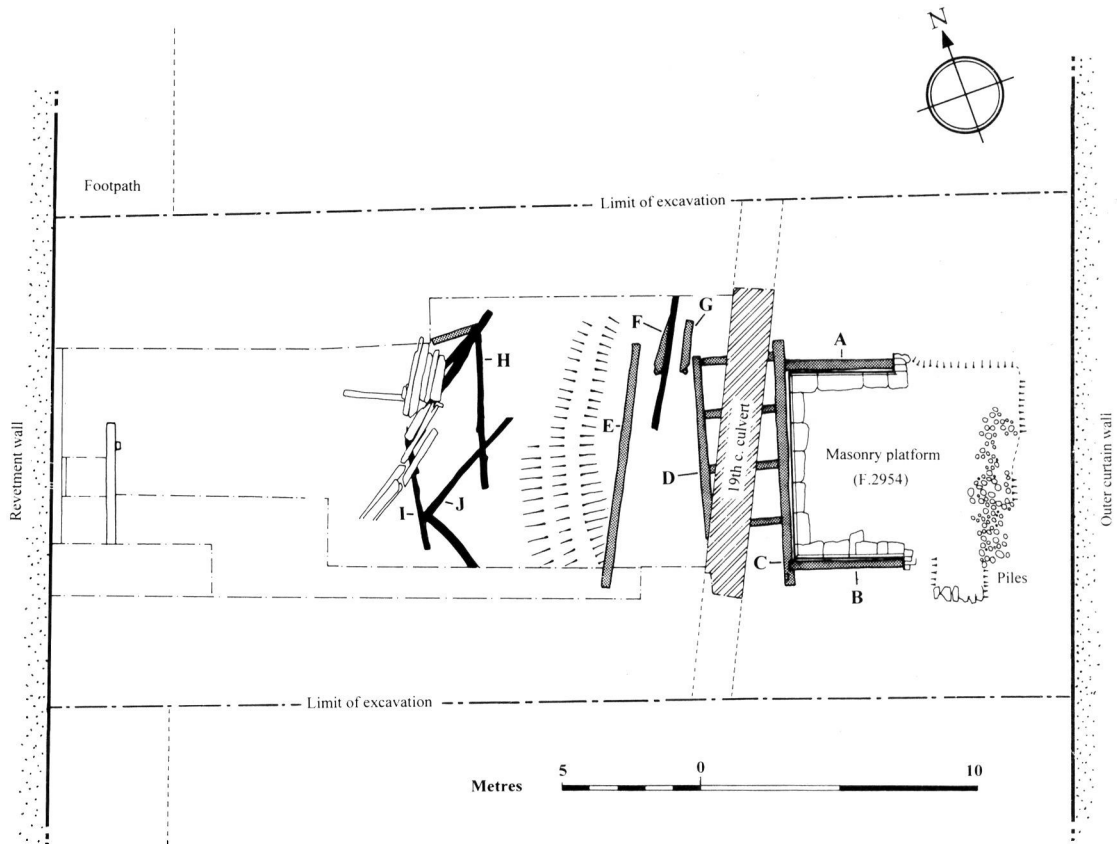


Fig 3. *Plan of Trench 27 and features within it (Oxford Archaeological Unit)*

The initial interpretation was that the timber had rolled, and that these mortices originally housed vertical struts, but this was disproved by the discovery of a diagonal-cut mortice at each end of the east face, evidently securing raking timbers in the same plane.

Only one other squared and jointed timber was discovered, partially exposed in the north section; this was an oak beam of the same scantling as the main north-south members, and containing a mortice comparable to those found in timbers C, D and E; very probably it served the same function. Eight unconverted beech trunks (including those marked H, I and J on Fig 3) were found to the west of timber D, all of which returned a felling date to the winter of 1240-41.

Subsidence

As noted above, the masonry platform had clearly subsided, and subsided unevenly, while

the articulated timberwork attached to it was massively distorted: the most pronounced subsidence of the platform was on its east-west axis, the ashlar courses on the north side dropping approximately 300mm in little more than 4m; it had also sunk on a diagonal axis, the north-east corner being 50cm higher than the same course to the south-west, as if its superstructure had been leaning eastwards and southwards. The timbers attached to the platform's north and south elevations remained housed into the masonry returns, but their western ends, together with the north-south framing attached to them, remained at a higher level, no single timber being anything approaching the horizontal. Exactly which elements have sunk and which may have remained relatively stable was not entirely clear, but the position of the platform in relation to the timberwork suggests that the platform may not have just sunk at one side, but subsided overall. At the same time the southern

part of the timber box frame and its masonry fill appear to have been levered up, as waterlain silts were discovered underneath them.

Dating

We now come to the business of dating the structure and the events and interventions which can be identified from the remains. So as to avoid any premature conclusions, the documentary and literary evidence will be introduced later on, while considering the form and function of the structure and its implications. The central questions concern or include the date of the piling, the date of the subsidence, and the date of the structure itself.⁹ In addressing these we are armed with one absolute date: we know for certain that the trees used for shoring up the platform were felled after the growing season of 1240 and before that of 1241.

The date of the piling

The dendrochronological date provides a clear *terminus post quem* for the piling, as this clearly cannot have taken place before the trees were cut in 1240. The felling date does not, of course, identify the year of use, as the piles could in theory have been in store for many years. Nevertheless, the fact that not only these timbers but groups of others at three related positions all returned the same date, suggests that they were all cut for a particular season or item of work in that year, reinforcing the case for dating the piling operation to 1240. In any case the shoring-up cannot have taken place after the completion of the Edwardian curtain wall, even in its initial 13th-century form, as in the absence of any opening through the wall, it could have had no conceivable function.

The date of the subsidence

The date of the subsidence is clearly *not* given by the date of the piles. The possibility that the function of the piles has been misunderstood, and that the stone structure subsided at a date very much later than 1240, within the Edwardian moat or its fills, can be ruled out: Professor John Hutchinson¹⁰ has observed that this could only have been caused by a far greater concentration

of weight than water or backfill could impose. However, it could in theory have occurred well before remedial action was taken, in other words, if the suggested date of the piling is accepted, at any time before 1240. Equally, if we argue that the piles were taken from store, then the subsidence could have occurred well *after* that date.

The date of the masonry

Dating the masonry might have been helped by dendrochronological analysis of the associated framing, and this was keenly awaited for several weeks, but, alas, the timbers were too fast grown to provide a date.¹¹ Similarly, stratigraphic evidence was almost non-existent or unobtainable; the natural and/or redeposited clay beneath the structure was not accessible enough even to look for dating evidence, while any early deposits on the top of the structure had been removed by scouring in the 18th and 19th centuries or earlier. The date of the piles fails to date the structure any more than it dates its subsidence or shoring-up for the same reasons, so that, leaving aside the literary record, remaining clues lie only in the design and execution of the masonry. Stylistically, the platform could date from as early as the late 12th century, and it of interest that the Bell Tower, known to date from the 1190s, stands on a similar stepped/chamfered plinth, and employs both Reigate stone and courses of Purbeck-like Sussex marble: on these grounds Dr Geoffrey Parnell (pers comm) has suggested that the platform may date from the same period: the use of Sussex rather than Purbeck marble and differences in chamfer detailing suggest that they are at least of different campaigns, but on practical grounds this is a sound proposition; the platform could very well have been associated with the late 12th-century defences, which at this point are generally assumed to have been on the alignment used both by Henry III and Edward I. The validity of this, however, will be seen to lessen when these questions are considered in the light of the documentary and chronicle evidence. Even without this, however, a combination of circumstantial, archaeological, stylistic and practical grounds all tend to date the structure to the period c.1190–1240 – with a preference for the last decade.

Identification and function

To identify the function of the platform, its situation in relation to the plan of the castle and its development, suggestions drawn from other sites, and indications in the documentary and literary record must all be considered. The range of possibilities can be narrowed down by the dating, but if it is accepted that the platform could significantly pre-date the piles, a large number of possibilities still remain. These arise out of uncertainties as to the form and extent of the castle as found by Henry III. Prompted by some ambiguous but tantalising archaeological evidence,¹² but more particularly by the reference in 1135 to the position of St Peter's church *in ballium*,¹³ these focus on the possibility that a large outer bailey once accompanied the surprisingly small inner enclosure which is known to have existed in the late 12th century. The likelihood of this is not increased by the extent of the property which Henry III had to expropriate in order to expand the castle,¹⁴ but if such an enclosure did exist, the structure could have been, for example, a mural tower or gate-tower on its western circuit. Another possibility, mentioned above, is that it was in some way associated with Longchamp's works of the 1190s. If so, it could have functioned either as an outwork to the main entrance – assumed since 1963 to have stood on or near the site of the Beauchamp Tower (Colvin 1963, 709, fig 60; Allen Brown 1977, fig 2) – or as a mural tower, in which case Longchamp's western rampart would have had to diverge westwards from the line of the existing wall and have enclosed a larger area than is usually supposed.

The *Chronica Majora* and its implications

Tantalising as these speculations are, the siting, dendrochronological dating, construction and, perhaps above all, the distortion of the feature all point firmly to an association both with Henry III and with the disasters of 1240 and 1241, and it is on these that attention will now be focused.

First of all, it is worth presenting the entries themselves, both of which occur in the *Chronica Majora*. Almost the whole content of both passages is in some way relevant, and deserves quoting in full. The earliest, firmly placed in 1240, states that:

In that same year on the evening of the Feast of St George, the stonework of a certain noble gateway which

the king had constructed in the most opulent fashion collapsed, as if struck by an earthquake, together with its forebuildings and outworks. When the king heard of this he gave orders that the ruined building should be rebuilt, more soundly this time and at still greater cost.¹⁵

Eodemque anno, structura lapidea cuiusdam nobilis portae, quam sumptuoso nimis labore rex construxerat, quasi quodam terrae motu concussa, cum suis antemuralibus et propugnaculis nocte sancti Georgii corruit. Quo audito rex, multiplicatis sumptibus, jussit illud ruinosum restaurari et in melius redintegrari. (Chronica Majora IV, 80)

The second, equally firmly dated to 1241, relates that:

At about this time, a night-time vision appeared to a certain wise and godly priest, in which an archbishop, wearing his full vestments and brandishing a cross in his hand, came up to the walls which the king had then raised next to the Tower of London, and looking at them with an angry expression, he boldly struck the walls hard with the cross in his right hand and said 'to what end are you being rebuilt?' Suddenly the walls collapsed as if they had been struck by an earthquake, although they were only recently built.

At this a clerk appeared following the archbishop. The priest, terrified by what he had seen, asked him 'who is this Archbishop?' He replied 'This is the Blessed martyr Thomas, a Londoner by birth, who sees these buildings as an insult and a danger to the Londoners; that is why he has destroyed them irreparably'. The priest replied 'but what about the cost and effort of the workmen? He has ruined it all'. The clerk answered him 'if the poor needy workmen were able to buy food with the wages they earned, that is indeed a good thing, but these walls were built not for the defence of the realm but to harm innocent citizens and if the Blessed Thomas had not destroyed them, his successor Saint Edmund the confessor would have uprooted the foundations even more violently'.

When the priest awoke from his sleep, he remembered what he had seen and though it was still the middle of the night, he openly told the story to everyone in the house. Early next morning, a rumour spread through the whole city of London, that the walls which had been built around the Tower, on which the king had spent more than twelve thousand marks, collapsed irreparably. Many people wondered at this and declared it was an evil omen, because at exactly the same time, that is to say, Saint George's night, but in the previous year, the same walls fell down together with their outworks. The citizens of London were completely amazed at this and not at all sorry. The walls were like a thorn in their eye. They had heard people taunting that the building of the walls was an insult to them, because if anyone dared to stand up for the rights of the city, they could be clapped in irons and imprisoned inside. Many cells could be seen in the buildings for the imprisonment of large numbers separately, so that none of them could speak with another.¹⁶

Circa dies illos, cuidam presbitero viro sancto et prudenti in nocturna visione revelatum est, quod quidam archipraesul pontificalibus ornatus, crucemque in manu sua bajulans, venit ad moenia, quae tunc rex iuxta Turrim Londoniarum construxerat, et torvo ea vultu respiciens, impulit ipsa fortiter et impetuose cruce quam portabat dextra, et ait; "Ut quid reaedificamini?" Et subito corruerunt moenia de novo constructa, quasi quodam terrae motu labefacta. Et

his visis sacerdos perterritus ait cuidam clerico, qui videbatur suum sequi archipraesulem, 'Quis est hic archiepiscopus?' Et ille; 'Beatus Thomas martir, natione Londoniensis, qui considerans haec fieri in contumeliam et praedudicium Londoniensium, diruit irrestaurabiliter'. Et sacerdos; 'O quot expensas et artificum labores irritavit'. Cui clericus; 'Si pauperes artifices stipendiis inhiantes et indigentes inde sibi victualia promeruerunt, tolerabile est; sed quia non ad regni defensionem, sed ad innocuorum civium gravamen constructa sunt, si non ea beatus Thomas diruisset, sanctus Aedmundus, confessor et successor eius, crudelius ea funditus evertisset'. Et his visis memoratus sacerdos expergefactus a sompno, surrexit, et in medio noctis conticinio palam, quae sibi videbantur, omnibus in domo existentibus enarravit. Mane autem facto, per totam civitatem Londoniarum rumor increbuit, quod moenia Turrim aedificata, pro quibus construendis rex plus quam duodecim milia marcarum effuderat, irrestaurabiliter corruerunt, multis admirantibus et quasi pro malo praenostico praecnantibus, quod eadem nocte, immo eadem hora noctis anno praeterito, scilicet nocte sancti Georgii, ipsa muralia cum suis propugnaculis corruerunt. Pro quo casu cives Londonienses minime dolentes, vehementer obstupuerunt. Erant autem eis quasi spina in oculo. Audierant itaque minas objurgantium, quod constructa erant memorata moenia in eorum contumeliam, ut si quis eorum pro libertate civitatis certare praesumeret, ipsis recluderetur, vinculis mancipandus. Et in plures pluribus includerentur carceribus, multa in eisdem distinguebantur diverticula, ne quis cum alio haberet confabulationem. (*Chronica Majora* IV, 93–4)

Before the archaeological evidence is examined and re-assessed in the light of these passages, it is worth underlining the certainty that a collapse really did occur in 1240, although whether Paris's text really indicates a second collapse in 1241 is open to question. Paris was not an over-inventive chronicler,¹⁷ and had first-rate sources available: these could have included accounts by guests at St Albans—the King and his retinue stayed there nine times during his reign (Vaughan 1993, x) and conversation in London, even perhaps with the 'wise and godly priest'. Given that the abbey was so near London, that it possessed a lodging there,¹⁸ and that Paris was a frequent traveller, he may even have seen the fortifications with his own eyes. In addition, the events not only took place during Paris's own lifetime, but were written up within a few years of their occurrence.¹⁹ But should there be any doubt that a Tower did indeed collapse in or shortly before 1241, this can be dispelled by the plain and factual entry in the Liberate Rolls for the 23 September 1241, recording an order to the Constable: 'to pull out the lead and boards which lie under the Tower recently fallen, to bring together the timber and freestone and put them in a suitable place'.²⁰

Identification with the works of 1240–1241

The reasons for proposing a link between the events described by Matthew Paris and Feature

2954 have been outlined above. But one of them – the site – requires a little more explanation, as no indication of the doomed buildings' position is given by Matthew Paris himself: the evidence is largely circumstantial, although backed up to some extent by Stow, whose claim that the new buildings had been made 'on the west side' of the castle (Stow 1908, I, 47) may have been based on oral sources or written ones now lost. Otherwise the arguments remain those set out by Colvin in 1963, who after dismissing the identification of St Thomas's Tower with the disaster site, continues:

If, as seems certain, the Bloody Tower could only be approached by water, it is necessary to look elsewhere for the main landward entrance to the Tower from the City of London. Its site is not recorded in any contemporary document, but it may be suggested that in the twelfth and thirteenth centuries it is likely to have been on the site of the Edwardian Beauchamp Tower. Before the creation by Edward I of the existing entry through the Lion, Middle and Byward Towers, the main approach to the Tower from the City of London must have been along Great Tower Street, which is aligned directly on the Beauchamp Tower, and it is difficult to see where else the main gateway can have been at this time. (Colvin 1963, II, 712)

Allen Brown may have been over-confident in stating 'that it stood in fact on the site of the present Beauchamp Tower' (Allen Brown 1984, 21), but the evidence points overwhelmingly to the fact that Henry III's ill-fated 'noble gate' was at least on this side of the castle and at approximately this point.

Once this is established, or at least accepted, the precise function of the building represented by the buried structure, and how it and any associated structures may have looked when complete, can be considered.

Original function

In the first place, both the scale of the structure and its situation 28.5m west of the (now inner) curtain wall, almost rule out identification with the 'noble gate' itself, but strongly suggest that it may have been one of the outworks – the *propugnacula* or *antemurales*. Paris describes these features as belonging to or 'with' the 'noble gateway' (it fell *cum suis antemuralibus et propugnaculis*), but this does not mean they were actually part of the gate complex, or contained gateways themselves. Whether the known platform could have carried an outer gateway – rather than being some other kind of outwork – depends largely on the purpose of the timber structure

attached to it. If this were best interpreted, for example, as a quay fronting on the moat, or no more than a reinforcement to the stone structure, it cannot have been a gatehouse, but positive identification as a bridge would leave almost no other interpretation possible.

It seemed at first, during the process of excavation, that the massive north-south timbers were the sill-beams for bridge trestles of the kind discovered or inferred, for example, at Abingdon (Allen 1990, 27), Bodiam (Martin 1973, 4–8, figs 2 and 3), Caerphilly, Eynsford and Kirby Muxloe.²¹ However, as explained above, the diagonal struts can only have lain in a horizontal plane, which makes interpretation as a bridge more complex. The most plausible solutions are possible if the structure is considered as incomplete – as is suggested by a number of what may be marked-out and partially drilled mortices in some of the timbers. In this case, the major north-south timbers and the diagonals at their ends could have been intended to form pointed ‘starlings’, similar to those which carried the 13th-century Wye bridge at Chepstow, as illustrated by Rigold, or shown on the medieval seal (Innsbruck) which he reproduces (Rigold 1975, 53–4); the intervening east-west timbers would have defined the interval and provided additional stability. A timber superstructure would have been the most likely intention, perhaps also similar to that at Chepstow, where vertical and raking uprights are tenoned into the side timbers of the starlings. Another possibility is that the horizontals were intended to form the lowest tier of a caisson-type of pointed timber cutwater, as has been suggested, with some reservations, by Jean Mesqui (pers comm); if completed, the successive tiers would have been bonded with nails, pegs, or halving joints at the angles.

Virtually the only interpretation which would allow for the bridge having been completed is that the horizontals formed a subframe either underneath or surrounding masonry cutwaters (carrying a stone or timber superstructure), but if so it is difficult to see the purpose of the timberwork, and this interpretation can probably be discounted.²² On balance, the likeliest interpretation is that the remains represent a timber bridge, which, if completed, would have consisted of a roadway carried by timber trusses standing on framed starlings.

In any case, it can be accepted that it was at least intended that the stone structure should be

abuted by a bridge, and that this was to have extended across the moat to Tower Hill. In this case the masonry platform must have carried a gatehouse, beyond which a roadway would have led to the main gate in the curtain wall. The alignment of the building with Great Tower Street, in addition to other structural features described below, indicate that this was part of the main entrance complex and not, as its size might otherwise suggest, a postern.

Reconstructing the building

The limitations of the evidence make any attempt to reconstruct the building a risky business. However, some elements of its plan and siting are clear enough; in particular, the north, western and southern flanks of the platform were meant to be exposed (although no doubt sometimes or even normally submerged), while the east side of the structure was built into a bank of clay, probably an artificial berm at the base of the curtain wall, backfilling the 1190 ditch. How far west the building may have extended is less clear. The irregular eastern edge to the platform may result from fracture during the collapse itself, but more probably shows that there was no exposed edge at this level on this side (although there must have been one at a higher level). The masonry returns to the north and south pose another problem, as it is not clear how far they may have once extended; the surrounding clays were particularly difficult to differentiate at this point, and there are no stratigraphic indications either way. An obvious contention must be that they are the stubs of walls, otherwise completely robbed away; if so, we have to conjecture a previously unknown curtain wall, or take it that the walls returned eastwards, flanking the route to the main gate, as in the 12th-century examples at Conisborough (Thompson 1991, 3–4) and Framlingham (Raby & Baillie-Reynolds 1984, 8–9, 23–4) and those which achieved their final form in the 14th century at Alnwick, Lincoln (Stocker 1984, 22–3) and Warwick. Another possibility is that they carried small rectangular staircase turrets, analogous to those serving Henry III’s surviving mural towers and Edward I’s gatehouses elsewhere at the Tower.²³ However, while these and other reconstructions remain possible, it is more likely that the returns have been robbed of little more than their northern

and southern facings, and that they formed the bases for buttresses.²⁴

Beyond the gate, the roadway must have continued to the main gate; if this was on the site of the Beauchamp Tower, it must have followed a curved or angular course (Fig 4), which, in creating a 'bent entrance', would have made it easier to defend.

Attempting to reconstruct the building in elevation is riskier still, but again there are a

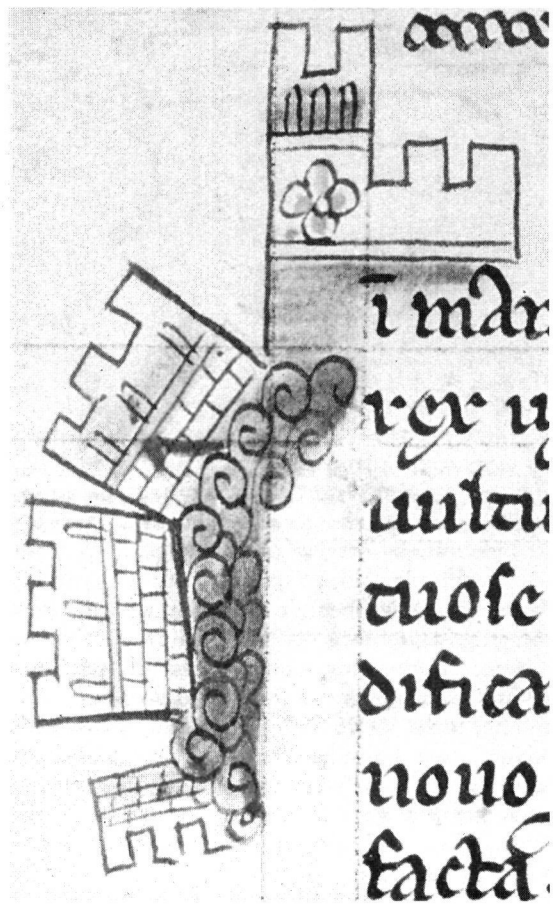


Fig 4. Marginal illustration to one of the two autograph copies of Matthew Paris's *Chronica Majora* (MS 16, f143r Corpus Christi College, Cambridge), adjacent to the text describing the events of 1241. As with Paris's other depictions of the Tower, the details are not to be relied on, but the impression given of a major disaster in 1240–1241 is borne out by his text, other documentary material and new archaeological evidence. Reproduced by kind permission of the Master and Fellows of Corpus Christi College, Cambridge

number of clues. In the first place, 'ground level' must have been as much as 2–3m above the platform's upper surface – approximately the level of the roadway under the Byward gateway (4.080 OD), to have allowed for the height of the bridge and to have cleared the tides. The roadway itself can only have been about 4m wide, without a separate gateway for pedestrians, to allow for a sufficient wall thickness at either side – particularly if one wall was to accommodate a stair. How the gate itself might have functioned will never be established, but the distance of 3m between the platform's western edge and the nearest (postulated) bridge trestle would have allowed for a drawbridge in front of it.²⁵ The tower may have been capped with a platform immediately above the gate, but could also have risen through another storey, which would have made it both more effective and more imposing to look at – an important consideration, given that it would then have been visible down the entire length of Great Tower Street.

The suggested reconstruction of the function and general form of the building is supported by the existence of comparable buildings at other sites: the closest parallel is the entrance to the inner bailey at Portchester (Hants), a single-entrance gateway within a (formerly) freestanding single tower half projecting into the moat and half built into its bank, dating from the 13th century (Rigold 1975, 16, 22; Cunliffe & Mumby 1975–85, 87–93, pl xxvi and xxvii, figs 87, 88 and 89). Two features in particular, however, set it apart from these, and would have rendered it a fitting part of the main entrance to the country's greatest castle. Beric Morley pointed out at an early stage that a plain square tower of these proportions, standing in isolation, would have looked rather clumsy, suggesting that the square plan may have converted to octagonal (or faceted) by the use of broaches – as in the contemporary Water Tower at Kenilworth (Thompson 1991, 16–17) and the Colton Tower at Dover, also a gatehouse and dated to the reign of John;²⁶ in the event this was supported by the subsequent discovery, within an appropriate context in the moat fills, of a massive Purbeck marble slab cut to form a facet of this sort. The tower's visual impact was almost certainly increased by a continuation of the plinth's banded stonework over the superstructure, as is suggested by the recovery of scattered fragments of Purbeck and Reigate ashlar from the moat fills.²⁷

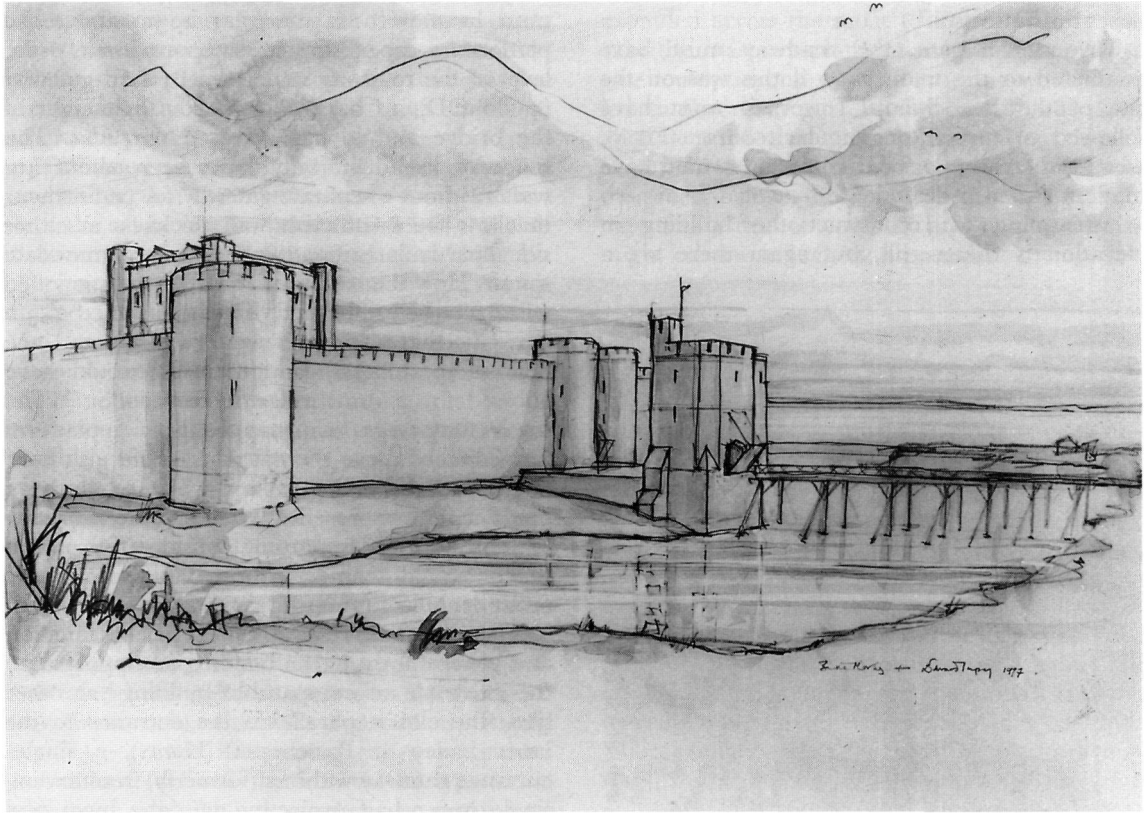


Fig 5. The western entrance to the Tower of London as it might have looked viewed from the north-west on the eve of April 23rd 1240 (or, depending on the interpretation of Matthew Paris's text, exactly a year later). The building represented by Feature 2954 is reconstructed as a free-standing barbican tower, approached from Tower Hill by a bridge across the moat and linked to a main gate (also reconstructed) in the curtain wall. It has since been shown that the bridge was never completed (Edward Impey)

The collapse and after: the western entrance and defences 1240–81

1240–1241

The discussion should perhaps begin with the question as to which of the chronicled collapses the demise of the building should be attributed. This in turn, as will be seen, raises important questions as to the interpretation of Paris's text. On the face of it, the collapse of 1241, certainly permitted by the available dating evidence, might seem the most likely: Paris states that after the 1240 event the king ordered the ruins to be rebuilt, but that 1241 saw them collapse 'beyond repair' (*irrestaurabiliter*). The fact that the outwork was clearly *not* rebuilt suggests that it was put up *de novo*, or possibly restored, after April 23 1240, and that its collapse and abandonment happened on April 23 1241; nevertheless, it could just as

easily have been a part of the 1238–1240 campaign which was omitted from the rebuilding ordered by the king after the first disaster, and other variations on the theme are possible.

The main permutations will be considered below, but considering these issues focuses attention on Paris's far from lucid account and what he may actually have meant. Clearly the interpretation of Feature 2954 would be clearer if there had been only *one* collapse, in 1240, as this would suggest a very simple sequence of events: building 1238–1240, collapse in April 1240 and consolidation of the ruin with piles cut for the purpose later in the same year. Paris's text has, however, always been assumed to imply two collapses, and this is the reading of Stow (1908, I, 47), Bayley (1825, I, 14–15), Colvin (1963, 713), Allen Brown (Charlton 1978, 30) and Parnell (1993, 34). But if, prompted by the new archaeological evidence, the second passage

is scrutinized in detail, it becomes clear that there is no deliberate, specific mention of a collapse in 1241: the priest has a dream in which this happens, and in the morning a rumour circulates in London that the dream has been dreamt, but not that the walls have actually fallen down. When Paris says that the citizens ‘proclaimed it a bad omen’ (*pro malo praenostico praeconantibus*) the reference is, in turn, to the rumour and not the fact: the populace took it as a ‘bad omen’ – in other words one that might be fulfilled – simply because precisely what the priest described had happened exactly a year before. The subject of the citizens’ astonishment could similarly be identified as the dream and prophecy, not the collapse, which would explain why, although pleased, they ‘kept quiet about it’. The use of the word *reaedificare* by the phantom archbishop by no means necessarily refers to a rebuilding after 1240, as it could also have referred to a rebuilding of much earlier work. Equally, the use of the word *irrestaurabiliter* of the postulated 1241 collapse may not distinguish it from the previous one, when the king ordered rebuilding, as it could simply mean that complete rebuilding rather than repair had been required in 1240. Nor are the accounts of what happened given by the two passages sufficiently different to confirm that they relate to different events.

Given the ambiguity of the passage, the proposed reinterpretation must remain hypothetical, but in discussing the condition and development of the Tower’s western approach and defences in the period 1240–c.1281, it is still necessary to offer two alternatives for the early period. If we accept that there was only one collapse, in 1240, we can reconstruct a sequence of events over the next year or so: between 1239 and early in 1240, the king initiated and maintained a rapid building programme. Paris’s description of the ‘noble gate’ as ‘recently built’ suggests that it was complete on the eve of its collapse, as does the additional information offered about the ill-fated sector to the effect that it was sufficiently advanced for the public to be able to identify ‘the many cells for the imprisonment of a large number’ at the time of its collapse. However, the indications are that the associated timber bridge had not been completed, and thus that access to the castle must have been via some other temporary route while building was in progress.

In any case, on 23 April, the ‘Noble gate’ and its outworks collapsed, upon which the king

ordered immediate rebuilding, and the ‘Noble gate’ was perhaps indeed rebuilt (in one form or another) but the ruined outwork was deemed beyond repair; nevertheless, as a roadway to the gate was still required, the ruin was shored up to carry a partially rebuilt or improvised bridge and causeway across the moat. The process of re-opening the entrance, at least on its original route, may have taken some time, for it was only in September that the order was issued to recover as much as possible of the valuable building materials ‘from under the tower recently fallen’.

If it is accepted that there were two collapses, the outwork could, as suggested before, have been a new creation after April 1240 which survived until April 1241. However, it could also have been created before April 1240, and have been abandoned, save for shoring up, after the collapse in that year.

Both these sequences imply that, following the collapse (or collapses), Henry III ended up with a western entrance to the castle, shored up, improvised or rebuilt but which at least followed the route across the moat, aligned on Great Tower Street, intended in 1238. Worth mentioning at this point, however, are an observation and a discovery made this year: firstly that part of the existing south-west causeway appears to be earlier than the main Edwardian build, and secondly that remnants of a dam-like structure of beech piles, all dated to 1240, survive deep in the moat fill to the north of the causeway. Graham Keevill has suggested that the disasters of the 1240s may have led Henry to abandon his bridge and outwork arrangement and divert the route into the castle across a causeway in the position of the existing one, reaching the ‘Noble gate’ or its replacement via a roadway between the base of the wall and the moat.

1241–1275

The impression given is that the impetus of the late 1230s, which had probably seen through the completion of the new walls to the north and east and the excavation of the ditch, never picked up after the 1240s. The general slowing down of works is borne out by the records. Although expenditure on materials and building work continued, and some of the unitemised work may have included attention to the defences,²⁸ only repairs to domestic buildings (*Calendar of Close*

Rolls 1247–1251, 300), the building of a bear house (*Calendar of Close Rolls* 1251–1253, 157), an elephant house (*Calendar of Liberate Rolls* 1251–1260, 198), the translation of its remains (*Calendar of Close Rolls* 1256–1259, 256) and other minor items or very general orders are given in at least the published summaries of the Close and Liberate Rolls or appear in the MS Pipe Rolls and Enrolled accounts.²⁹ An order in 1244 for stone and timber deemed ‘superfluous’ to be sent from the Tower to Westminster (*Calendar of Close Rolls* 1242–47, 167) suggests a shift in priorities, particularly when even nine years later the stone defences were still incomplete – the King ordering palings ‘to fortify the whole breach of the bailey of the Tower of London’ (*Calendar of Liberate Rolls* 1251–1260, 147). The crisis of 1261, when the King’s repudiation of the provisions of Oxford became public knowledge, provoked a flurry of expenditure – over £1000 being spent in one year (Colvin 1963, II, 713 and footnote 7), but the ultimate failure of the castle in the face of De Montfort’s followers in July 1263³⁰ suggests it had not been spent to great effect. That the west side of the castle remained inadequate throughout Henry’s reign is indicated by the works of his son, which, in addition to everything else, included the building or complete rebuilding of the whole of the west (now inner) curtain wall. It also included the Beauchamp Tower, assumed to stand on or near the site of Henry III’s ‘Noble Gate’, but which would surely have been an unnecessary effort had the gate been sufficiently complete or impressive to merit being kept or converted. The impression is certainly that Henry’s great scheme never recovered from the setbacks of the 1240s, and that for forty years the castle’s western defences and its western approach remained improvised and inadequate.

1240–41 to 1281

All this does, in addition, have implications for our understanding of the order and nature of the works undertaken by Edward I. In the first place, the west moat as he found it was much wider and deeper than has been supposed in the past – not just opposite Feature 2954, but, as also revealed by excavation in 1996–97, nearer its junction with the river; less of the moat as it exists today, at least on this side of the castle

may be attributed to him than has been the case to date. Secondly, it confirms, once again as pointed out by Colvin, that the south-western entrance complex must have been completed, or at least have been in use, before the outer curtain wall was completed (Colvin 1963, II, 721).

CONCLUSIONS

The original appearance, the function and date of the building represented by Feature 2954, the sequence of events in 1240–41, and the form of the mid 13th-century western entrance complex as a whole may never be fully understood or established. However, the balance of probability suggests the following conclusions:

1. That Feature 2954 dates from 1240 or very shortly before;
2. That it collapsed in 1240;
3. That it could be identified, independent of any documentary or literary evidence, as the remnants of a gateway intended to have been approached by a timber and/or masonry bridge;
4. That its position, date range and likely function identify it as part of the ill-fated gate complex referred to in the *Chronica Majora*.

Numerous important questions of course remain, some of which might be answered through further scrutiny of the original documentary sources, or, more likely, through further excavation within the Edwardian moat³¹ and between the two curtain walls. Nevertheless, the discoveries of 1995–97, elucidated by an astonishingly graphic coincidence of archaeological and chronicle evidence, can be said to have added very considerably to our understanding of the western entrance to the Tower as intended by Henry III and of the events in 1240–41.

NOTES

¹ The Tower Environs Scheme was initiated in 1995 by the Historic Royal Palaces Agency, in conjunction with three other partners, to improve the surroundings of the Tower of London. One of the proposals is to re-excavate and re-flood the Tower moat. The excavation described below formed part of a series of studies to find out if this would be possible within the constraints of conservation and technical feasibility. See E. Impey & G. Keevill *The Tower of London Moat*, 1997 p1 (privately circulated).

² *Cumque cancellarius ille in Angliam veniret, fecit Turrim Lundoniarum circumdari fossato profundissimo, sperans quod*

Tamensis fluvius perinde transiret (*Chronica Magistri Rogeri de Hovedene*, p33).

³ In addition, the facing to the Tower's lower stages shows that the wall cannot have continued in any other direction.

⁴ The sum was expended *ad faciendum inde diversa utensilia tam ferra quam lignea et picosius tam aliis diversiis empcionibus necessariis emptis ad magnum fossatum faciendum circa castrum predicti Turris a tamesia versus civitatem usque ad Tamisiam versus hospitem beate Katerine* (E 372/120, *rot comp 2*).

⁵ A convincing reconstruction of the completed scheme (as in c.1325), in the form of a model, was installed in the Constable Tower, Tower of London in August 1997, as one of a series of improvements to the display and interpretation of the East Wallwalk. The model was built by Mick Dunk of AD Modelmaking (Frome), based on a brief prepared by Beric Morley, Jeremy Ashbee and Edward Impey. An article on the rationale behind the reconstruction and the results of new research which went into it is being prepared by Beric Morley.

⁶ A drawing of the most ambitious scheme is illustrated in G Parnell *The Tower of London* (p78, fig 57). Parnell attributes it to De Gomme's own hand.

⁷ I am grateful to Dr Steven Brindle for information on the construction of Tower Bridge and its approach road (*The Tower of London Moat, Wharf and Outworks*, Section IV 4.2).

⁸ See J Harvey 'The western entrance of the Tower' *passim*. The existing configuration of the western entrance, including the bridge over, and on the alignment of, the north-south Lion Tower causeway, dates from the 1960s.

⁹ The masonry and timber framing are clearly contemporary (see p 62 above)

¹⁰ Emeritus Professor of Engineering and Geomorphology, Imperial College London, pers comm 1996.

¹¹ Pers comm, Ian Tyers and Graham Keevill.

¹² In particular the discovery of anomalies in the natural at the bottom of the west moat trench which could mark the intersection with an earlier ditch, well to the west of any known pre-13th century moat on this side of the castle. Graham Keevill pers comm.

¹³ *Cartulary of Holy Trinity Aldgate*, no.964. The author is grateful to Stephen Priestley for pointing out this reference. Ambiguity about the precise meaning of the word *ballium*, used in a judicial as well as a topographic sense, leaves this issue in doubt.

¹⁴ An entry in the Liberate Rolls in June 1239 lists the individual institutions indemnified for the 'damages they have sustained by the wall and ditch of the Tower of London. *Calendar of Liberate Rolls* 1226–40, p396; C62/13m 10. The number of claimants, and the total value of the claim – £166 – implies a substantial area. Although much of this may have lain to the east of the castle, the list includes enough claimants other

than St Katherine's and Holy Trinity, who can be presumed to have owned most of the land in this area, to suggest that areas to the north and west may have been acquired as well, and thus that they were not already included in an outer bailey.

¹⁵ Translation by Jeremy Ashbee.

¹⁶ Translation by Jeremy Ashbee.

¹⁷ On Paris as a historian, see R Vaughan *The Illustrated Chronicles of Matthew Paris*, vii–xiii.

¹⁸ The house was in Bartholomew Lane, opening off Threadneedle Street. Stow wrote that 'In this street, built amongst other fayre buildings, the most ancient was of old time a house pertayning to the Abbots of St Albans'. (*A Survey of the City of London and Westminster*, I, p180.)

¹⁹ The fact that Paris refers to Archbishop Edmund as *sanctus Aedmundus* may infer that the text was written after 1246, the year of Edmund's canonisation. Jeremy Ashbee pers comm.

²⁰ *Calendar of Liberate Rolls* 1240–5, p74. The original text (C 62/15 m4) reads: *Precepimus tibi quod per visum Ricardi clerici de Sarum et Roberti de Basing et Petri Bacun custodum operacionum turris nostre Londinie extrahi faciat plumbum et bordas que iacent subtus Turrim que nuper corruim et maeremium et francam petram coadunari et in loco competenti locari*. The author is grateful to Stephen Priestley for transcribing this entry.

²¹ For the last three see S Rigold 'Structural aspects of medieval timber bridges' pp 73, 79, 81 and figs 28, 31 and 32.

²² Jean Mesqui writes concerning the interpretation of the timbers as having lain beneath a stone pier: 'This would seem most unrealistic. It is impossible to imagine why the builders would have thought it necessary to place wooden frames beneath the piers, even though no timber was placed under the masonry platform. In addition, it is hard to understand why they would have needed beams linking the frames, while in fact the beams would have been more suited as a base for the lowest courses of masonry'.

With regard to the idea that the horizontals might have surrounded the base of a stone pier, Mesqui writes that 'this has the advantage of being in keeping with the framing around the masonry platform. But what could have been its function? I can only see it having served as a template for building the foundations, but this seems most unlikely'. Pers comm 1997.

²³ As suggested by John Steane.

²⁴ As suggested by Beric Morley.

²⁵ As suggested by Julian Munby.

²⁶ See, for example, C Platt *Dover Castle* p17. The upper part of the tower was rebuilt in the 15th century, but the transition from square to polygonal is original.

²⁷ Lindy Grant has pointed out that the banded effect may have been intended to give the building a Roman appearance. Nicola Coldstream has suggested that the

resulting banded appearance of the building, and perhaps others associated with it, may have been the inspiration for Edward I's use of the motif at Caernarvon and elsewhere, rather than more exotic sources such as the Theodosian walls at Constantinople which are usually suggested.

²⁸ Such as the order on 14 December 1249 for the 'king's buildings in the Tower to be repaired and roofed' (*Calendar of Liberate Rolls* 1245–1251, p243).

²⁹ The author is grateful to Stephen Priestley for examining these sources in detail.

³⁰ For the political and military impact of these events on the Tower of London and Henry III's use of it, see D Carpenter *The Reign of Henry III*, pp 199–209.

³¹ In reality, this will only happen if Historic Royal Palaces's proposal to re-excavate and re-flood the moat is carried out.

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The archaeological discoveries described above were made during the excavations 1995 to 1997, directed by Graham Keevill of the Oxford Archaeological Unit on behalf of Historic Royal Palaces, and this article could not have been prepared without the information, interpretation, advice, comments and other help which he has constantly provided. Particular thanks are also due to the following for their assistance: Jeremy Ashbee, for help with many points of interpretation and for the translations printed above; Dr John Blair, Dr Lindy Grant, Anna Keay, Professor Gwyn Meirion-Jones, Dr Geoffrey Parnell and John Steane for reading and commenting on the text in draft; Dr David Stockton for verifying various points of translation; Stephen Priestley and Dr Lucy Vinten Mattich for thoroughly trawling the documentary record and commenting on its significance; Jean Mesqui for commenting at length on the interpretation of the medieval bridge structure; to Duncan Wood, assistant site Director 1995–97, and other Oxford Archaeological Unit staff for their heroic efforts under exceptionally difficult site conditions; to HRP staff, particularly those at the Tower of London working on the Tower Environs Scheme, for their various contributions.

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