

# The Cow Tower, Norwich: An East Anglian Bastille?

By A. D. SAUNDERS

*BUILDING ACCOUNTS for 1398–99 give detailed costs of the construction of a circular, brick, free-standing artillery tower. The artillery towers at Southampton and Canterbury were linked to existing wall circuits, and detached forts in France may be more comparable to the tower at Norwich.*

Standing alone in the Great Hospital Meadows on the right-angled bend of the R. Wensum at the NE. corner of the city the Cow Tower counted among the walls, towers and water defences which ringed medieval Norwich (Fig. 1; Pl. VI). The two and a quarter miles of wall enclosing nearly a square mile have been described by Dr H. L. Turner.<sup>1</sup> The traditional date for the beginning of the enclosure of the city is 1253 and there are several references to substantiate such a date. Subsequently there are many references to murage grants, the construction of defences and repairs to walls and towers. The defences appear to have been completed by the time the series of Treasurer's Accounts become continuous in 1378 since the Accounts only refer to repairs, with the exception of the detailed account for the building of the Cow Tower in 1398–99.

As transcribed and published by Hudson and Tingey the Treasurer's Accounts refer to the Cow Tower as follows:

*The Dungeon* Paid to Robert Perkyns for 1,000 bricks (*teguil*) 5s 6d. To Godfrey Coupere for 12 hoops of 2 barrells, 8d. To the same for 6 hoops and 2 *barrelshedes settingin*, 4d. For the carriage of 20,000 bricks, 2s 1d. For the carriage of hirdeles and piles from the Stathe, 4d. For the carriage of 3,000 bricks from the Common Stathe as far as the Dungeon by water, 4d. To Richard Wilbeghe for 3,500 bricks, 17s. 6d. To Robert Snape, mason for 12 shotholes at the Dungeon, price 9d a piece, 9s. To the same for 30 *nowels* price 3d a piece, 7s 6d. For making the *wyndes* and *rote*, 2s. To William Blakehommore for 5,350 bricks, price per 1000 5s, 27s 3d. To Thomas Fyncham for 3,000 bricks at the Dungeon, 12s. To William Chaudeler for 1,000 bricks, 5s. For a barrell bought at the Dungeon for tubs, 6d. For making 4 tubs of the said barrel, 6d.

Although the first clear mention of the Cow Tower occurs in this building account for 1398–99 there are traditions of an earlier tower in this locality. According to Blomefield<sup>3</sup> a tower in the Hospital Meadow called the Dungeon was built at first to command the river passage in order to levy the tolls then belonging to the prior and was used as a prison for the jurisdiction of the Cathedral. Later, a purpose-built

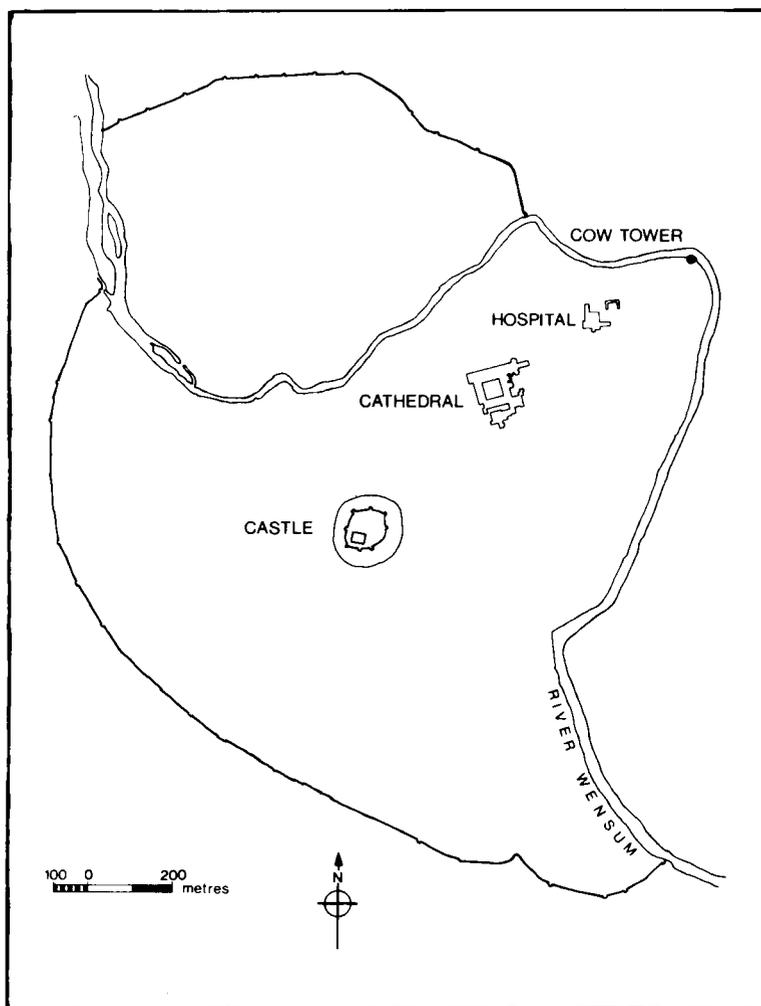


FIG. 1  
COW TOWER, NORWICH: Location map

toll house was established in Holm Street and the tower was then assigned to the Hospital. It was in a ruinous state until 1378 when the master of the Great Hospital conveyed it by the name of the 'Great Tower called the Dungeon' to the city for ever and it was rebuilt by the city at great expense. In the Treasurer's Accounts for 1394-95 for *Le Dungeon* 40d. was paid 'for roofing (*coopturi*) the tower at the Hospital'.<sup>4</sup> There is an earlier payment in 1388-89 to 'Richard Blackhonmure for six lighters to the tower with bricks',<sup>5</sup> but it is uncertain whether the towers mentioned above are the same as the Cow Tower of 1398-99. The tower which served as a toll house may have been sited near the Bishop's Bridge.

There are no indications in the structure to suggest that the present tower is a rebuilding of something earlier. It appears to be substantially of one build from the foundation up. Certainly the nature of the building works under way in 1398–99 indicates that the tower is unlikely to have been the tower being roofed four or five years earlier. Either the earlier *Dongeon* was on another site or it was completely replaced by the later Cow Tower, or else the Treasurer was settling accounts considerably in arrears and the date of the Cow Tower is perhaps ten or more years earlier than the main building accounts suggest. Despite the correlation of the twelve ‘shotholes’ provided by Robert Snape with the cross-oylets in the present building the quantity of bricks accounted for (36,850) may have fallen short of the number contained in the tower.

With the exception of the Cow Tower brick is never used in an external load-bearing capacity in Norwich before the 17th century. It is incorporated into flint walling, used as dressings for openings, as in parts of the city wall, or in chimney stacks and particularly for vaulting.<sup>6</sup> The vaulting of the mural towers has been suggested to belong to their conversion to artillery defence *c.* 1385<sup>7</sup> but the brick in the city wall arcading is, according to Dr A. Carter, original, *i.e.* not later than 1342.<sup>8</sup>

As it stands today the Cow Tower is a handsome three-storey brick-faced tower 48ft (14.6 m) high, tapering to its eroded battlements. It is circular, 37 ft (11.2 m) in diameter, apart from a half-round projecting stair turret on the SW. side, with walling 6 ft (1.8 m) thick at the base (Figs. 2 and 3; Pls. VI and VII). The tower appears to be of unitary design and construction with superficial changes in the brickwork perhaps denoting seasonal work. There are ten lifts of putlog holes. The bricks are in various shades of soft pink and yellow but with a band of darker bricks at second-floor level. The dimensions of the bricks are roughly 9 in. (228 mm) by 4½ in. (115 mm) and 2 in. (50 mm) deep. At the base of the tower is a stone plinth with double roll moulding below three or four courses of knapped flints. Below the plinth is a brick and flint base battered in places. A doorway at ground level with pointed arch and chamfered ashlar dressings on the SW. side is the only entrance. The other openings consist of three windows, with chamfered brick jambs on each of the upper floors (the window on the ground floor is a later insertion), two small lights of pierced stone for the garderobes on the first and second floors, and four small lights in the stair turret. Of the remaining twelve openings on the first and second floors seven retain stone loops with short-armed cross-oylets of varying dimensions. In five openings the ashlar is missing. Each opening has a brick relieving arch above except on the second floor where four loops have been converted into square-headed windows. The stone for the loops on the second floor differs from that below, having a more yellowish colour. The cross-oylets too are wider. The spacing of the loops is staggered on each floor.

Internally, the doorway opens into a small brick rib-vaulted lobby in the thickness of the wall. From this a doorway leads to a wide newel stair, partly in the thickness of the tower wall and partly in the projecting stair turret, lit by small windows with widely splayed reveals. The ground-floor room has a large fireplace with a double flue. The single inserted window has a wide sloping cill. Three small triangular-headed recesses are provided in the wall face, two opposite the fireplace.

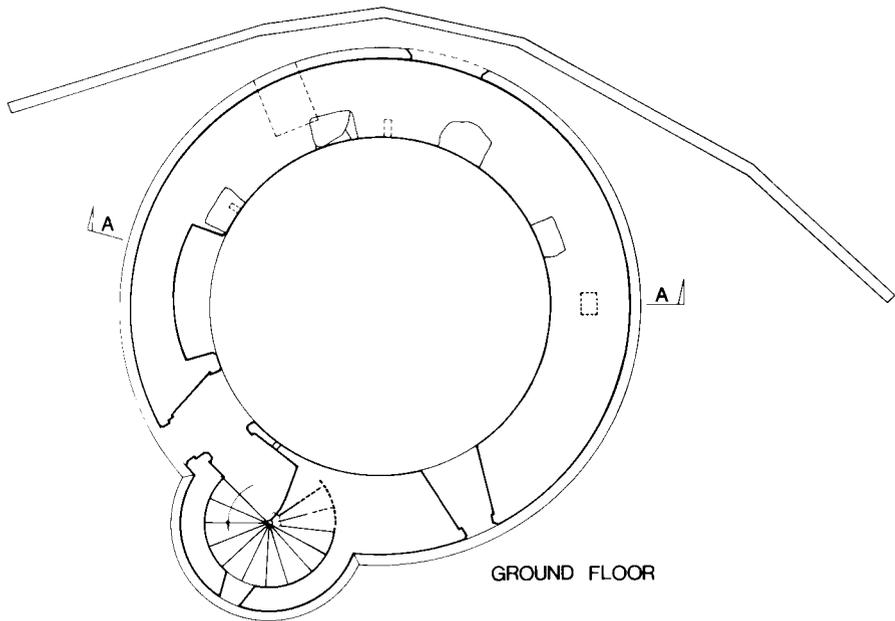
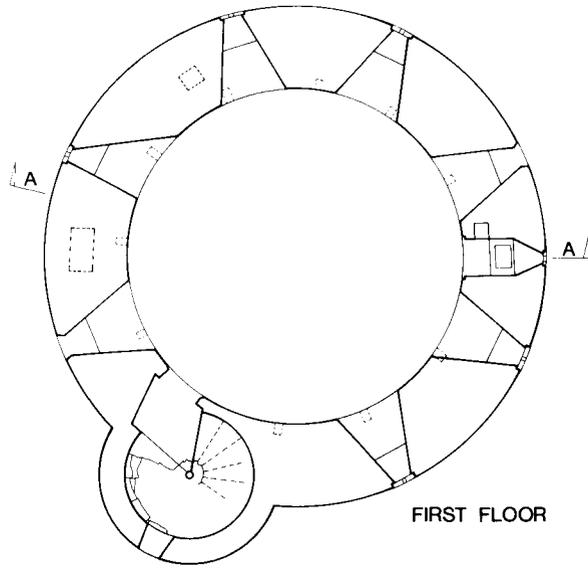


FIG. 2  
COW TOWER, NORWICH: Plans of ground and first floors

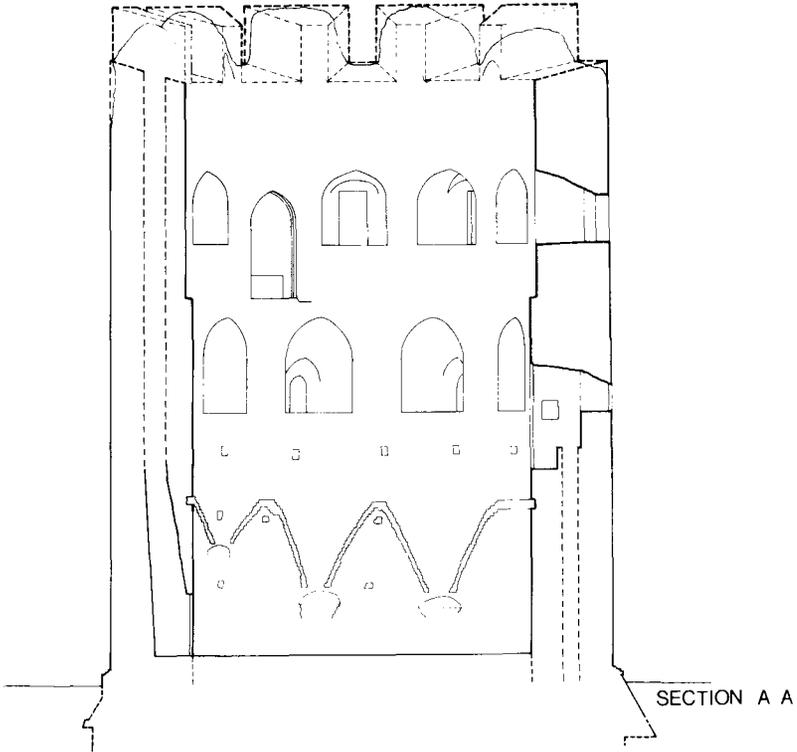
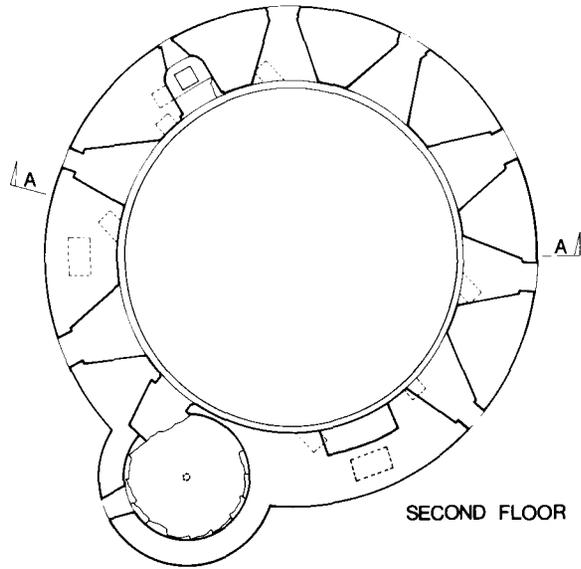


FIG. 3  
COW TOWER, NORWICH: Plan of second floor and section through the tower (Scale as in Fig. 2)

The remaining features of the ground-floor room are deep chases and sockets in the brickwork, presumably for wooden beams since the pitch of the chases is frequently too steep for the ghosts of vaulting ribs. There is no clear evidence for the support of the first floor — no beam sockets or offset in the wall face. Yet the level of the first floor is demonstrated by the thresholds of a garderobe doorway and the doorway leading from the newel stair. The floor must have been independent of the wall and support for it, or perhaps just a gallery, may have been taken from an irregular structure now represented by the chases in the brick face and from corbels (now missing) set within six wide semicircular-headed sockets located at varying heights in the wall face. There appear to be no obvious reasons for the considerable differences of level of the sockets (corbels). The chases are consequently of varying length but spring generally at  $45^\circ$  from the putative corbels. The chases do not break the lines of the relieving arches over the corbel sockets. They also respect the small triangular-headed recesses mentioned above. Some of the chases meet at an angle and others are flat-topped but they do not extend above a point two feet (610 mm) or so below the presumed floor level. The chases therefore appear to be the seating for angled struts springing from corbels at widely different levels: an irregular structure intended to support a timber plate which could carry the first floor independently of the wall.

As with the ground floor, the first and second floors areas have no subdivisions today. On the first floor there is a garderobe in the wall thickness and a window over the entrance and six embrasures originally provided with stone cross-loops. The cills of the embrasures are all about 4 ft (1.2 m) above floor level. The cills are flat at the level of the bottom of the cross-loop. The embrasures have pointed brick vaults at two levels. The heights are reduced to about  $3\frac{1}{2}$  ft (1 m) above the cill over the cross-loop. On the second floor there is another garderobe and six similar embrasures with cross-loops and a further opening which seems to be for a window rather than a loop. There is a fireplace with a flat-arched head in brick. The fireplace has a double flue like that on the ground floor. The general dimensions of the embrasures are similar to those below. The second floor, unlike the first, was carried on three main joists set into the walls and the floor was supported on an offset in conventional fashion.

The flat roof, or platform, was also supported on three massive timber joists, the holes for which are now very eroded. The parapet is the full thickness of the tower wall with nine splayed embrasures. Towards the city the embrasures have sloping cills but the seven facing the field had embrasures level with the platform. The merlons are still 6–7 ft (2 m) high with crenels 1 ft 9 in. (0.5 m) wide and 3 ft (0.9 m) above the platform. The chimney flues from the fireplaces on the ground and second floors opened out at platform level. Much of the upper stage of the tower was built of flint together with brick, with wall cores mainly built with flints.

Although the tower had been repaired by the then owners, The Great Hospital Trustees, in the late 19th century it had been done with cement capping on the exposed wall tops.<sup>9</sup> By the 1950s the tower was in a critical condition. Split almost from top to bottom by wide fractures in the vicinity of the garderobe shafts and undermined by the river, it was close to collapse (Pl. vi). Its maintenance was

beyond the resources of the Trustees and in 1953 it was accepted by the then Ministry of Works into its guardianship. Major structural repairs took place in 1953 and 1954. These principally involved a continuous reinforced concrete ring beam using high tensile steel rods underpinning the base of the tower, the tying of the fractures internally with reinforced concrete stitches, and steel piling of the river bank with a reinforced concrete apron between the tower and the piling. Consolidation of the standing brickwork and wall tops continued to 1958.

Not unusually for this date there seems to have been no formal archaeological watch or record of the preparations for such major structural repair. However, the trial excavation was photographed and it is possible to observe that below the ashlar plinth the battered brick and flint base was about 4 ft (1.2 m) deep. The whole tower was set on a chalk foundation which projected outwards to include the staircase tower. On the S. side there was evidence for a foundation of timber piles.<sup>10</sup>

The Cow Tower has many of the attributes of an artillery tower with its well-ordered arrangement of gun loops and its massive parapet and wide crenels. Its internal planning is less clear, though it gives an impression of being designed to be garrisoned. The large fireplace on the ground floor suggests a mess room but the lack of windows and the curious arrangement for supporting the first floor may indicate some special purpose. The upper two floors may have been intended for sleeping quarters since each floor had a garderobe and the second floor a fireplace. The puzzle remains the reason for the independent support for the first floor or a first-floor gallery sufficient to serve the gun ports. The overwhelming character, however, is defensive. The upper two floors are principally delegated to the service of two tiers of loops covering most of the complete circuit, except to the SW. towards the city.

A further tier of heavier weapons might have been accommodated on the platform to fire between the massively thick and lofty merlons in the parapet. Again the threat was an external one and the stair turret masked the interior quarter. Presumably height was required in order to command the high ground on the opposite bank of the river, if not to direct fire on the even higher ground of Mousehold Heath beyond. The stair turret seems to have been taken higher than the parapet and presumably served for observation.

The building accounts describe the purchase of stone 'shot holes' and it seems reasonable to identify these with the stone cross-loops that remain. The number purchased from Robert Snape, mason, tallies if one of the seven openings on the two upper floors contained a window as seems to be the case. The flat cill of the embrasures at the same level as the loops suggests the use of a weapon set on a flat bed, a familiar enough form of mounting for early hand guns if these loops were indeed intended for guns. The size of the oylet suggests a piece of very small calibre. The height of the rear portion of the embrasure would have given room for those working the piece if it was mounted on a flat wooden bed laid upon the cill. Alternatively it is just possible to envisage the loops being used for cross-bows. Apart from this there is no reason why either cross-bows or primitive guns could not have been used. What distinguishes the loops from most contemporary shot holes elsewhere in southern England at the time is the employment of such restrictive

openings as opposed to the single circular hole or the more common circular hole with sighting slit (inverted 'key-hole' type).<sup>11</sup>

The existence of guns and gunners in Norwich is attested as early as 1365<sup>12</sup> and again in 1384–85 and 1385–86.<sup>13</sup> It would seem that the city was well provided for in this way and the city wards were responsible for arming as well as maintaining their respective lengths of city wall.<sup>14</sup> There are many short straight slits along the circuit of the wall which look too small even for cross-bows and may be gun loops. There are two eroded loops which appear to be of the 'key-hole' type. It therefore comes as no surprise to find a purpose-built artillery tower along the circuit of defences.

In situation and form, the Cow Tower is distinct from other mural towers in Norwich except, in certain characteristics, the angle tower north of the Pockthorpe Gate. That tower is eight-sided with a pronounced batter on each facet. There are three internally splayed embrasures in the ground floor and four in the upper floor placed high up under a ribbed brick vault. The cills of the embrasures are well above floor level, as at the Cow Tower, and the existence of a vault supporting the roof or platform on top of the tower suggests the need to carry something substantial on the platform. Unfortunately, the exterior has been largely refaced in flint and modern brick quoins and there are no remaining external loops. However the general impression is of a tower designed for the use of guns.

The introduction of guns into English defences was common by the late 14th century. Guns, 'crakys of war', had been used by the English against the Scots in 1327 and are mentioned as employed in the Crecy campaign and siege of Calais in 1346.<sup>15</sup> The earliest illustrations of a gun are in the Milemete MS. of 1326.<sup>16</sup> Their initial use was against castles and town walls but by the last quarter of the 14th century their accommodation within defensive works was well established.

The earliest surviving English gun port is suggested by Dr D. F. Renn to be in the precinct wall of Quarr Abbey, Isle of Wight.<sup>17</sup> Licence to crenellate was granted in 1365.<sup>18</sup> The fortification which might have demonstrated the latest in military thinking of this period is Queenborough Castle, Kent, built by the king in the 1360s but totally destroyed after the Civil War.<sup>19</sup> Queenborough's plan is novel for its date, anticipating the centrally planned castles of Henry VIII, and it is unlikely that a castle of such advanced design would have failed to be equipped for defence by artillery. It is the missing link in England between defences designed for missile throwing by the principles of tension or torsion and the new cannon employing the propellent force of gunpowder.

By the 1380s certain conventions in the provision of guns in fortifications were established and it is from this decade that artillery fortifications in England effectively begin. Between 1380 and 1420 there are many defensive works which owe their origins to the vulnerable state of the southern coasts to cross-channel raiding during the period of French ascendancy during the Hundred Years War. It is a period of military architecture which also reflects the limitations of the firearms of the time. Technical progress was slow and there was little change in design until the radical developments in cannon during the middle of the 15th century.<sup>20</sup>

This initial period in artillery fortification was marked by the provision of gun loops, a variant of the traditional arrow loops, within the walls of towers and curtain

walls for light guns of small calibre, commonly described as hand guns. The surviving evidence is mainly restricted to the loops provided for such pieces. The use of hand-gun loops becomes common from 1386 onwards. Because this type of gun was the only sort that anyone other than a king, abbey or a municipality could afford they are frequently to be found in the private castles and defended houses of the nobility. Heavier guns, bombards, were known but if or when such guns were used they can only have been mounted on platforms in earthworks outside the walls or on top of towers. Evidence for their provision is harder to establish. Gun ports, of which the most distinctive and representative types at this period are the 'inverted key-hole' or a simple circular hole, are found in towers and curtain walls and have a very long life, well into the mid 16th century in England and even longer in Scotland. There are many variants of loops for hand guns<sup>21</sup> and they must be distinguished from the larger and often square ports for heavier guns which began to be introduced into English fortification during the latter half of the 15th century, as at Dartmouth Castle, Devon.<sup>22</sup>

It is only in town defences of the period 1380–1420 that distinctively purpose-built artillery works (as opposed to those castles and town walls where provision was simply made for the use of guns) can be found and then only in Canterbury, Southampton and Norwich. The West Gate of Canterbury has gun ports integral with the building, which is firmly dated to 1380, and the earliest known fortress in this country designed specifically for defence with guns. There are key-hole gun ports at three levels, eight in the ground floor, seven on the first and four on the second arranged to give overlapping fire in front of the gate.<sup>23</sup> The surviving parapet and crenellations make it unlikely that heavier pieces were mounted on the twin D-shaped towers.

The God's House Tower at Southampton projects from the earlier God's House Gate at the SE. corner of the town walls; it controls the sluices filling the double ditches and flanks the most vulnerable quarter of the town. The addition consists of a rectangular two-storey block with a square tower of three storeys at the eastern end. As an addition to the town walls, it belongs to *c.* 1417.<sup>24</sup> It doubled as an artillery defence provided with large key-hole ports for guns on the first floor of the rectangular range, and in the tower, and also as residential quarters for the town gunner. Cusped, two-light mullioned windows alternated with the gunports. The ground floor was originally vaulted and it was here that the town gunner kept his stock of artillery supplies and manufactured gunpowder. On the roof of the tower was the main gun platform with wide embrasures in the parapets for large guns. The platform was slightly over 21 ft (6.4 m) square. The parapets each contained a single embrasure averaging 15 ft (4.5 m) in width leaving a single merlon at the angles.<sup>25</sup> The wide embrasures seem intended for heavy artillery pieces perhaps on wheeled carriages capable of traversing widely. Recently discovered evidence indicates that there was provision for timber hoards round three sides of the tower well below the level of the roof platform and parapet.<sup>26</sup>

The Cow Tower at Norwich is therefore another of this very small group of surviving fortifications which were specifically designed for the employment of guns. It is the only one of the three which is free-standing. Like the God's House Tower it

combines living quarters with defence. Like Canterbury's West Gate the two tiers of hand-gun loops are carefully designed to provide the best field of fire.

The Cow Tower could have carried heavier guns on the roof platform as could the God's House Tower, Southampton. Neither tower was vaulted but the nature of the parapets suggests the ability to operate large pieces on wheeled carriages. The parapets, while differing one from another, are quite unlike most medieval battlements. At Southampton the wide crenel occupying almost all of each side can be paralleled in northern France at Dieppe Castle and on one of the mural towers of St Malo. At Norwich, the crenels are wider than usual and the merlons are the full wall thickness and at least 7 ft (2 m) high. The wide internally splayed embrasure and the 3 ft (1 m) high cill of the crenel would facilitate the operation of cannon. The form of the parapet on the Cow Tower is similar to that of the SE. angle tower of the artillery work at Threave Castle, Galloway, constructed about 1447.<sup>27</sup>

Specially designed artillery works, often circular, are sometimes recorded in the accounts of the campaigns in France during the latter half of the Hundred Years War. These defences were often thrown up outside the gates of towns and may be termed field works, but others may have been more permanent in intention. The description of one of the barbicans or bulwarks in front of the gates of Harfleur in 1415 illustrate their function in contemporary warfare.<sup>28</sup> In front of every gate

The enemy had already cunningly constructed a strong defensive work which we call a barbican but the common people 'bulwerkis'. The largest of them was circular, reinforced by thick vertical tree trunks, close set all the way round almost as high as the town walls. Reinforced inside by timbers, earth and beams hollowed out into cavities and recesses from which to receive an enemy and his attacks and with apertures, embrasures and small casemates through which their canelle (which in our language we call gunnys) and with missiles, crossbows and other weapons of offence they would harass us. And it was circular in construction with a diameter greater than the putting distance of the 'shot' which our common people in England are used to playing with at the butts.

On a hill outside Dieppe during the abortive siege of 1442-43 there was a bastille or detached fort.<sup>29</sup> During the siege of Orleans, 1428, the lines of circumvallation included a line of detached forts (bastilles).<sup>30</sup> A bastille is usually a tower of a castle but could also be a small detached fort. Placed as it is, isolated on an angle of the Wensum, perhaps the Cow Tower fits into this class of fortress more familiar to those who had campaigned in France. Indeed it is Viollet-le-Duc who wrote: 'it was more especially along navigable rivers and seaports that they had already in the 15th century begun to plant towers (or bastilles)'.<sup>31</sup>

While the concept of a purpose-built artillery tower was new in England around the turn of the 15th century, the means for disposing of its fire power was largely traditional. The loops which could only have been used for light, small calibre guns or crossbows were simply a refinement of the old arrow loop for another weapon. The chief difference lay in the concentration of loops at Canterbury and Norwich arranged for overlapping fields of fire and the provision for roof-borne heavier artillery at Southampton and Norwich. Future changes were to lie in the construction and adaptation of towers for heavier, larger calibre weapons at low level and

better arrangements for supporting outworks to cover ditches and gates together with improved flanking cover along the enceinte. But these developments were not to be seen until fifty or more years later.

## NOTES

- <sup>1</sup> H. L. Turner, *Town Defences in England and Wales* (London, 1970).
- <sup>2</sup> W. Hudson and J. C. Tingey, *The Records of Norwich*, II (Norwich, 1906–10), 52.
- <sup>3</sup> F. Blomefield, *History of County of Norfolk*, II (London, 1806), 402.
- <sup>4</sup> Hudson and Tingey, op. cit. in note 2, II, 151.
- <sup>5</sup> *Ibid.*, II, 50.
- <sup>6</sup> R. Smith and A. Carter, 'Function and site: aspects of Norwich buildings before 1700', *Vernacular Architecture*, 14 (1983), 6.
- <sup>7</sup> *Ibid.*, 6, note 16: ex inf. F. Woodman.
- <sup>8</sup> *Ibid.*, 6, note 16: ex inf. A. Carter.
- <sup>9</sup> There is a description of the tower in A. E. Collin's *Report of the City Committee as to the City Wall presented to the Council at its meeting of 15 March 1910* (Norwich, 1910).
- <sup>10</sup> Photographs and Drawings held by Historic Buildings and Monuments Commission, Fortress House, 23 Savile Row, London, W1X 2HE.
- <sup>11</sup> J. R. Kenyon, 'Early gun ports, a gazetteer', *Fort*, 4 (1977), 4–6.
- <sup>12</sup> Hudson and Tingey, op. cit. in note 2, I, 396.
- <sup>13</sup> *Ibid.*, II, 47 and 48.
- <sup>14</sup> R. Howlett, 'Norwich artillery in the fourteenth century', *Norfolk Archaeol.*, 16 (1907), 46–75.
- <sup>15</sup> O. F. G. Hogg, *English Artillery 1326–1716* (London, 1963), 196–201.
- <sup>16</sup> The first illustrations of guns appear in two English illustrated manuscripts: *De Secretis Secretorum*, London, B.L. Add. MS. 47680 and *De Nobilitatibus Sapientum etc Prudentum Regum* by Walter de Milemete, Oxford, Christ Church MS. 92.
- <sup>17</sup> D. F. Renn, 'The earliest gun ports in Britain', *Archaeol. J.*, cxxv (1968), 301–03.
- <sup>18</sup> C. Coulson, 'Hierarchism in conventual crenellation: an essay in the sociology and metaphysics of medieval fortification', *Medieval Archaeol.*, xxvi (1982), 94.
- <sup>19</sup> R. A. Brown, H. M. Colvin and A. J. Taylor, *The History of the King's Works*, II (London, 1963), 793–804. (Queenborough).
- <sup>20</sup> J. R. Kenyon, 'Early artillery fortifications in England and Wales: a preliminary survey and reappraisal', *Archaeol. J.*, cxxxviii (1981), 205–40.
- <sup>21</sup> As identified by Kenyon, op. cit. in note 11.
- <sup>22</sup> B. H. St J. O'Neil, 'Dartmouth Castle and other defences of Dartmouth Haven', *Archaeologia*, lxxxv (1936), 129–59.
- <sup>23</sup> D. Renn, 'A note on the West Gate gunloops', 117 in S. S. Frere, S. Stow and P. Bennett, *Excavations on the Roman and Medieval Defences of Canterbury, The Archaeology of Canterbury, vol. II* (Maidstone, 1982).
- <sup>24</sup> Inf. from R. Thomson.
- <sup>25</sup> P. A. Faulkner, 'The surviving medieval buildings', 62–67 in C. Platt and R. Coleman-Smith, *Excavations in Medieval Southampton 1953–1969 vol. I* (Leicester, 1975).
- <sup>26</sup> Two levels of carefully constructed square through holes in the walls of the tower have been revealed in conservation work carried out by Southampton City Council.
- <sup>27</sup> C. J. Tabraham and G. L. Good, 'The artillery fortifications at Threave Castle, Galloway', 55–72 in D. H. Caldwell (ed.), *Scottish Weapons and Fortifications 1100–1800* (Edinburgh, 1981).
- <sup>28</sup> F. Taylor and J. S. Roskell (eds.), *Gesta Henrici Quinti* (Oxford, 1975).
- <sup>29</sup> A. J. Pollard, *John Talbot and the War in France 1427–1453* (London, 1983), 59–60.
- <sup>30</sup> A. H. Burne, *The Agincourt War* (London, 1956).
- <sup>31</sup> E. Viollet-Le-Duc, *An Essay on the Military Architecture of the Middle Ages* (Oxford, 1860), 217.

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