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## Fifteenth Century Changes, and Sixteenth Century Evidence for Bell Founding in Easton Parish Church, Cambridgeshire

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*In 2010, while the ground floor of the tower of St Peter's church, Easton, was being excavated for a new floor, evidence for a temporary bell foundry was discovered. Excavation below an exposed circular scorch mark in the floor of the south-west corner of the tower revealed a shallow pit edged with tiles. The pit contained fragments of flattened clay, some lumps of dross or flash, charcoal pieces and greasy, black sand. Near the pit the remains of a small furnace or oven, also scorched from intense heat, were uncovered and close by those was a quantity of refined clay on a slate, apparently ready for use. The use of a shallow, heated pit for drying out bell moulds is supported by descriptions of bell founding from the 12th century onwards. The circular scorch mark in the floor of the tower and the excavated pit below this had a diameter sufficient to accommodate one of the two surviving 16th century bells. The two bells have been attributed to the Newcombe family from Leicestershire who cast 17 bells in Huntingdonshire over a period of 70 years. They were the second and fourth bells, formerly in a ring of four; the second thought to be a pre-Reformation bell. The late 14th century tower and early 15th century rood screen suggest a period of wealth affording the alteration and changes to the building that included the recasting and rehanging of the bells in a 'new' 16th century bell frame.*

### The excavation of the tower floor 2010

In 2010, the floor of the west end of the nave and tower of St Peter's church, Easton (a village historically in Huntingdonshire) was taken up and re-laid with new limestone slabs and bricks (Fig. 1). The excavation of the floor entailed lifting the cracked and broken floor tiles that were probably laid in the late 18th or early 19th century and which had been covered by later repairs and some cement infilling. Coarse orange-coloured sand below the tiles was carefully removed, revealing a lime-washed floor surface. This kind of finish would have been used to seal the floor of the tower when it was built; the external tower walls had also been lime-washed, like the rest of the church, and remains of lime wash can be seen in protected areas of the masonry today. In the south-west corner of the tower floor, equidistant from the side walls, was a circular scorch mark approximately 40 inches (1.02m) in diameter. Excavation revealed that this was

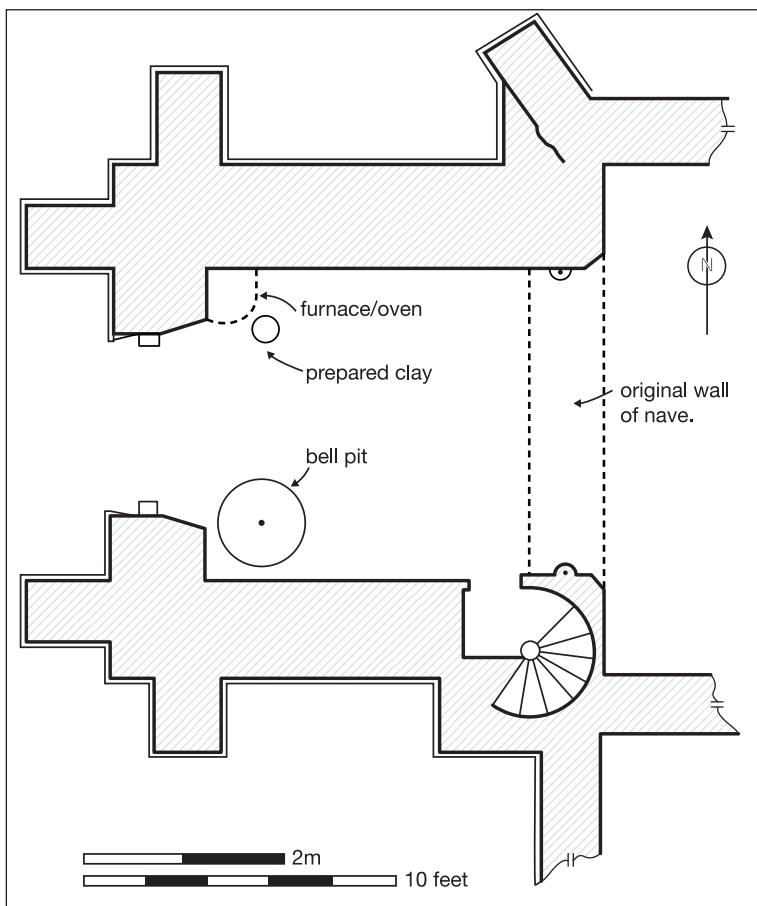
underlain by a circular, shallow pit, 9 inches deep, cut into the floor surface, it had a scorched perimeter and an extended flare mark on the south-west side suggests a draught from the use of bellows. The rim of this shallow pit, c. 9 inches (0.23m) deep and 39–40 inches (1.02m) in diameter, was edged with tiles laid obliquely towards the centre against a backing rim of clay. In the centre of the base of the pit was a flat piece of limestone that had been broken. It was noted that the south and west walls of the tower were also lightly scorched above a height of 18 inches (0.46 m). The area of the pit and the scorch marks are shown on photographs (Figs. 2, 3), taken at different stages of the excavation, and in the plan drawing of the pit (Fig. 4). Half of the area of the pit was excavated by removing sand backfill, revealing blackened sand, greasy in texture, mixed with some pieces of charcoal and several large and small pieces of dross or flash, flattened lumps of fine clay and three small pieces of 18th /19th century domestic pottery.

After being photographed and measured, the debris was returned to the pit. The excavated area was then covered with a membrane to protect it from the laying of a new brick floor.

Excavation also revealed the remains of a small furnace or oven in the north-west corner of the tower with accompanying scorch marks on the floor and walls (Fig. 5); it had probably been damaged when a safe was installed in the 1960s. Near the furnace/oven were the remains of a light-coloured metal dross, possibly of tin, and a large quantity of refined clay putty, some of which was in a small heap on a slate, as if in preparation for use.

### Surveys and dating of the bells and bell-frame

The Reverend Theodore Owen carried out a meticulous survey of church bells in Huntingdonshire in the late 19th century, published as *The Church Bells of Huntingdonshire* in 1899. There were four bells at that time, two clearly much older than the others. Owen attributed the two ancient bells, by their marks or stamps and inscriptions, to the Newcombe bell founding family of Leicester. From the inscriptions on the ancient bells Owen believed one was



*Figure 1. Plan of west tower,  
Easton church.*

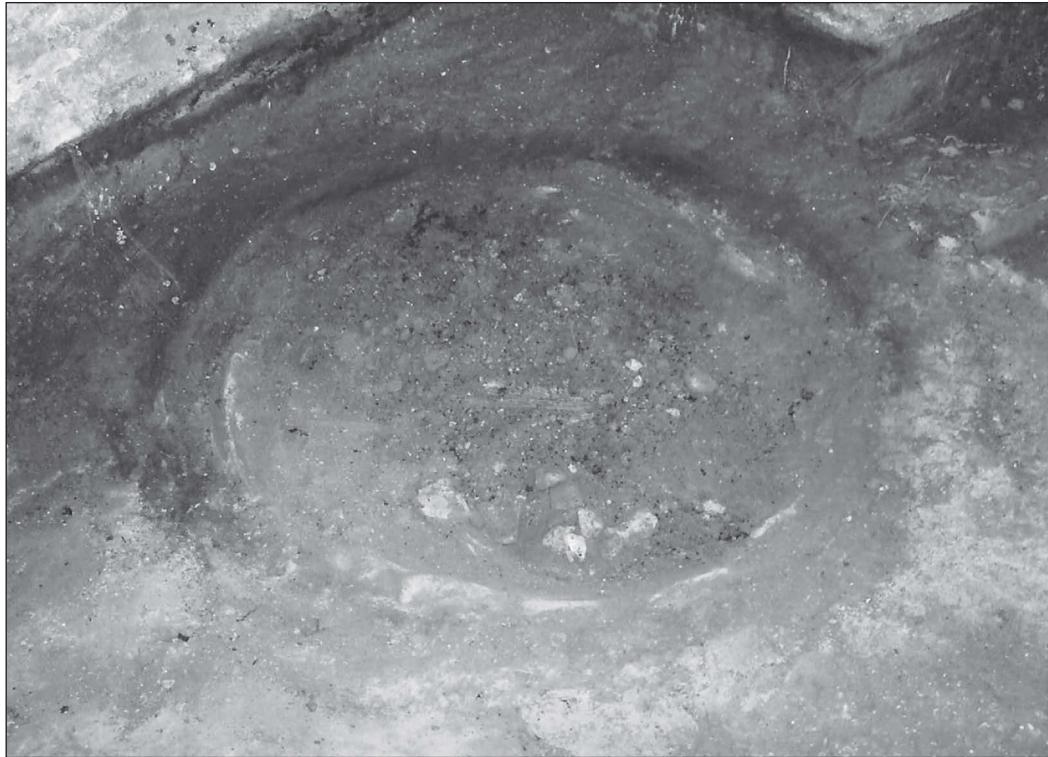
cast in the Leicester foundry before, and the other after the Reformation. These bells, almost certainly early to late 16th century, are described as the second and fourth in the ring of four. The second bell inscribed SANCTA MAREA in a Gothic script and stamped with a cross was described by Owen as having a diameter of 34 inches (0.86m) and has been attributed to Robert Newcombe, 1510–1557 (RCHM (E) Huntingdonshire 1926). The fourth bell has the Leicester Crown and the rebus shield with the initials TN, interspersed between the words PRAISE THE LORD (with the E's reversed); it has a diameter of 39 inches (1.0m). The rings or cannons on these two Easton bells differ from each other, those on the fourth bell have a refined chamfer on their outer edge while the cannons on the second bell are plain (Owen 1899, RCHM (E) 1926, plate 7) (Figs. 6, 7a, 7b).

Thomas North comments on some changes in the casting of bells due to the Reformation, and establishes that there were 147 "ancient" bells in Leicestershire (North 1876, 20, 3304). He found some of their inscriptions and marks to be specific to the Newcombe family. Some marks, the Leicester cross and one with the initials TN (see Fig. 7b), were clearly identified with a Thomas Newcombe, who was either the founder of the family business and died in 1520 or his grandson, Thomas, who died in 1539; three generations of the Newcombe family were casting bells in the 16th century. North further comments that the marks

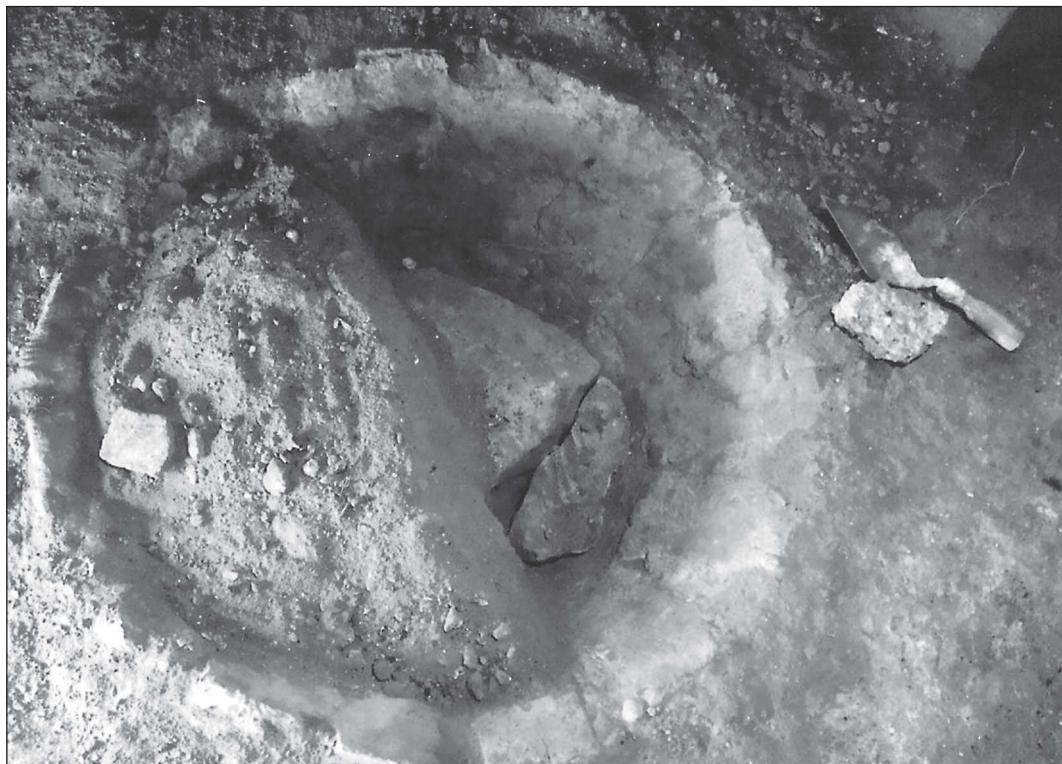
and inscriptions used by foundries may have been in use for several generations; a change was made at the Newcombe foundry by the beginning of the 17th century when the old sets of letters and marks were 'set aside for plain Roman capitals' (North 1876, 55). Therefore the Gothic script on the second Easton bell dedicated to "Sancta Marea" may have been used at any time in the 16th century but more specifically in the early to mid-16th century, when the dedication of the bell indicates its use by a Lady chapel. The presumably later inscription on the fourth bell could imply it is post-Reformation, but as it is undated, whilst many 17th century bells were dated, it was probably cast in the later 16th century.

Owen also describes the two other bells in the church, the first with the inscription HENRY PENN MADE ME 1718 (diameter 30 inches), and the third, inscribed to the church warden, Mr Whitehead, was founded by Taylor and Son of St Neots in 1821 (diameter 35ins). The respective diameters of all four bells are within the 39–40 inch diameter (1.00–1.02m) of the excavated pit. More accurate measurements of the bells were recorded in 1971 when they were rehung by Taylor's of Loughborough, giving diameters of 32.75 inches and 39.25 inches for the older bells.

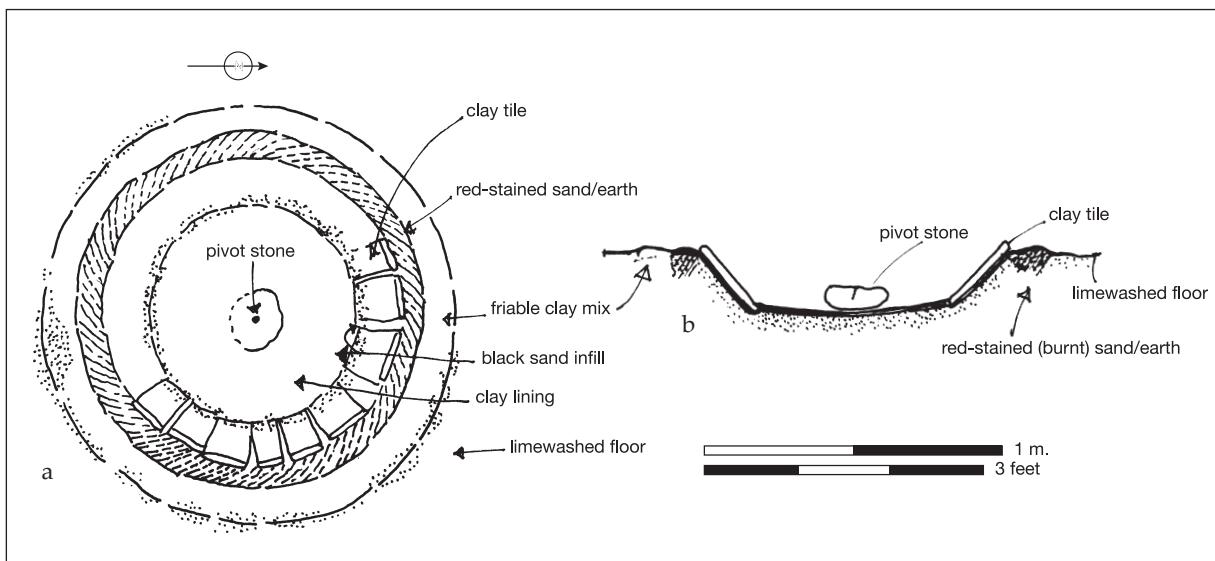
During the period of the Reformation in 1552, Edward VI's commissioners recorded four bells in Easton church, with a sanctus bell, 'Remaining at Eston 'Item iij belles and a Sauntus bell" (Lomas, 1906).



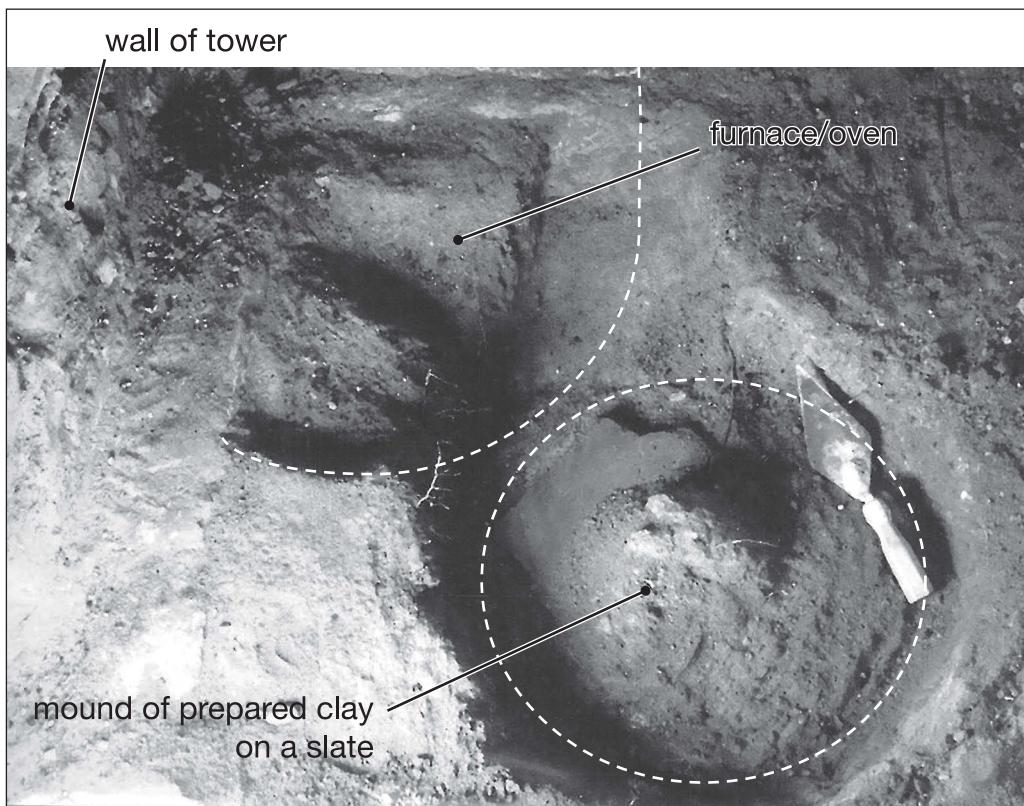
*Figure 2. The bell-pit on initial discovery in 2010. See also Plate 3.*



*Figure 3. Excavated bell-pit with stone for pivot in situ, burnt ring of tiles with clay, blackened sand with fragments of charcoal, note the lime-washed floor (2010). See also Plate 4.*



*Figure 4.* Scale drawings of excavated bell casting-pit: 4a, plan of casting pit; 4b, section of casting pit.



*Figure 5.* Remains of small furnace/oven and prepared clay on a slate in the north-west corner of the tower.

It is possible that one or both of the Newcombe bells were included in this survey, the other two, presumably older, bells at that time making up the four in number in the bell frame. The two oldest bells were eventually replaced by the later 18th and 19th century bells mentioned above (Owen 1899).

The bell frame in Easton church has 'pits' for four

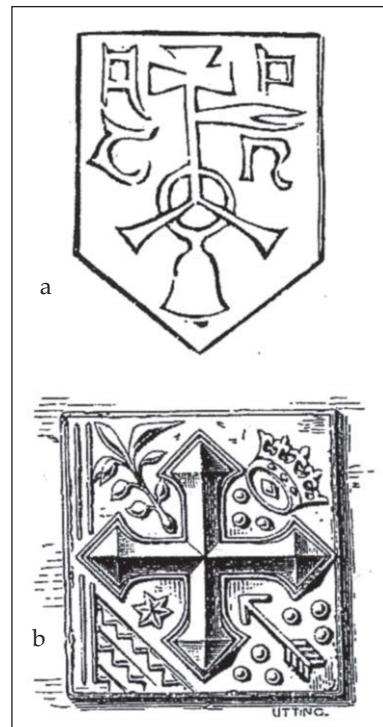
bells and is placed diagonally across the tower where the foundation beams rest in the belfry window openings, Cattermole (1990) remarks on bell frames occupying a diagonal position in smaller church towers in Norfolk and Walker (2006) notes that the Easton bell-frame is unusually set on the diagonal; the Easton tower is internally approximately 10 feet



**Figure 6.** The two 16th century Newcombe bells, second bell in forefront, by Robert Newcombe, fourth bell founded by Thomas Newcombe. Photo taken 2013.

(3.5 m) square. John Ladds and his son, Inskip Ladds, who was the Ely diocesan architect, were respectively responsible for the 1868 and 1904 restorations of Easton church; their archive of sketches and photographs is held in the Norris Museum, St Ives, where Inskip Ladds' sketch of the bell frame can be seen. It shows the position of the bells as they were (Fig. 8) before two of the peal of four bells were sold in 1970 to Taylor's of Loughborough as a parish contribution to the costs of rehanging the bells and repointing the tower. The two older bells were rehung together on metal girders within the 4th bell pit, as shown by Walker in his drawing of 1998 (Walker 2006) (Fig. 9).

The most recent survey of bell frames in Huntingdonshire was made by Walker (2006) who noted that Huntingdonshire was more prosperous than Cambridgeshire in the 17th century evinced by alterations to the bell towers. He cites twenty-three 17th century bell frames in Huntingdonshire, including the existing, altered, bell frame in Easton parish church. It is interesting to note that the bell frame in Easton is composed of five king-post trusses (Fig. 9), two trusses in a long frame formed on the foundation beams, and three, in the angles of the tower separately mounted on sill beams. The trusses stand



**Figure 7a, 7b.** Newcombe bell stamps from The Church Bells of Huntingdonshire, Owen 1899.

independently without corner posts where the pits 1, 2 and 3 are open. Cattermole (1990) and Walker (2006) both date the king-post bell frames to the 16th century. There are grooves on the king-post braces of the Easton bell frame made from full circle ring ing. Alterations to the bell frame are noted by Walker (2001, 2006) who suggests the bell frame was remade in the 17th century, but, on recent examination, the alterations he cites would seem to be the original foundation beams with repairs to the frame of the kind typically made in the 18th or 19th centuries.

#### The bell founders and evidence for bell founding in Easton

A bell foundry is recorded in Leicester in the 14th century. This may have been the original foundry used by Thomas Newcombe after his marriage to the widow of the bell founder in All Saints parish Leicester, after his death his widow remarried another bell founder, William Bett, who died in 1538 leaving his stepson Robert Newcombe the foundry. In 1540 Robert Newcombe bought land near All Saints church for a new foundry. Both he and his son

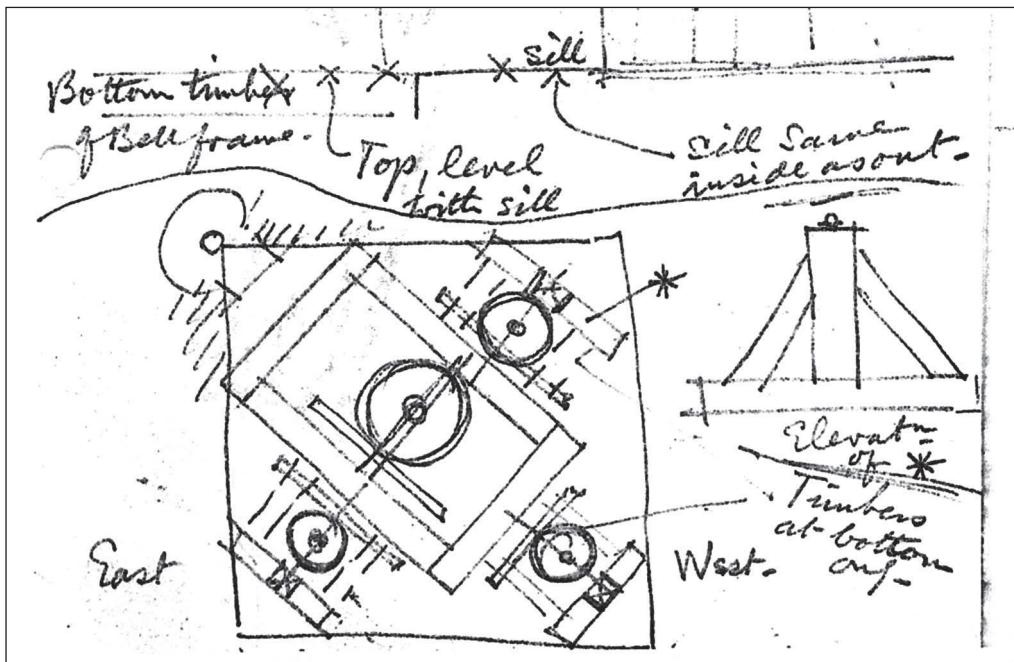


Figure 8. Sketch of the bell-frame by S. Inskip Ladds, 1904, Norris Museum, St Ives.

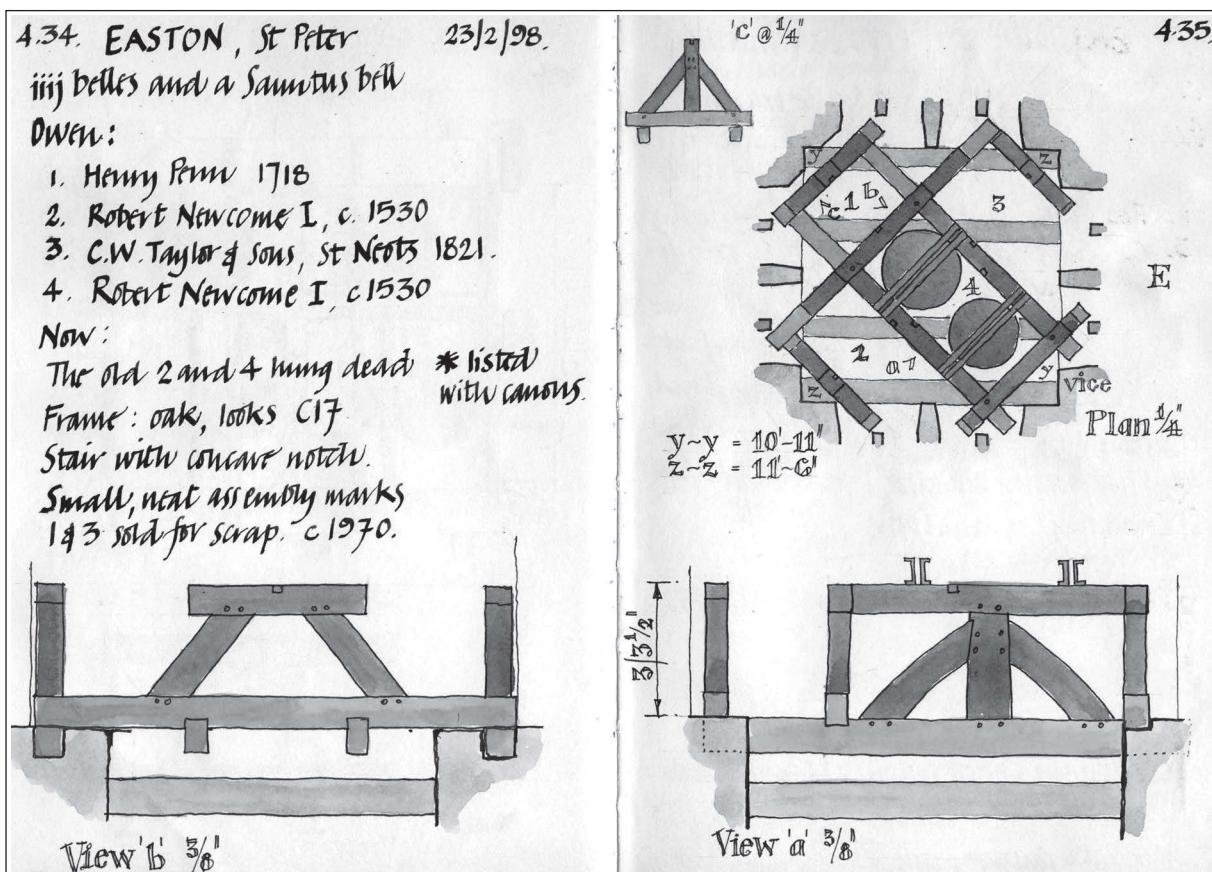


Figure 9. Survey drawing of bell-frame showing the king post, 1998, Robert Walker.

Thomas Newcombe (1541–1579) purchased bells from redundant abbey buildings, and brass "probably, in part, effigies," from churches in Leicester (North 1879, 47). Robert and Thomas Newcombe could have fulfilled most of their contracts on the foundry site. A Thomas Newcombe, by his mark, would appear to have been a prolific bell founder in the mid/late 16th century; 17 bells by the Newcombe family have been identified in Huntingdonshire by Owen (Figs 7a, 7b) (North 1876, Owen 1899).

Travelling with heavy loads on country roads at a distance from the foundry added to the expense of producing a bell, so having local materials and labour available in a rural area away from the foundry would have been an incentive to cast a bell near a church. The oldest bells in Easton church may have been reused in the 16th century for casting a bell *in situ*. Examples of the activities of itinerant bell founders are given in numerous excavation reports cited by Jennings (2006) in *Temporary Site Bellfounding Technology and the Itinerant Bellfounder's Technique*. He states 'Sites within buildings were preferred even if restrictions of space and stringent terms of occupancy were imposed', and continues, 'a tower with ... a very high first floor chamber could act as a chimney' (Jennings 2006, 102–103). He also comments on the destabilising effects of the Reformation which 'restricted the travelling bell founder's freedom of movement and his acquisition of metal supplies.' This appears in his summary of evidence for temporary bell casting sites, which were apparently few, four in number, in the immediate post-Reformation period (Jennings 2006, 96–98). It is possible, therefore, that the second bell was cast within the tower before the Reformation, and the fourth bell in the Leicester foundry, after the Reformation. The remains from bell casting in Easton are not enough to establish which of the two bells were founded there as most remains from breaking the moulds to release the bell would have been cleared away from the tower floor.

The nature of the shallow pit in Easton church (Figs. 1, 2, 3, 4) closely matches that of those described by Rodwell (1976), especially the 16th-century bell pit beneath the tower at St Peter's, Barton-upon-Humber (Rodwell, pers. comm.). The circular scorch mark feature and excavated pit, associated with the small furnace or oven nearby, in the tower of Easton is substantive evidence for the use of the tower as a temporary bell-casting site. The debris from the excavation, listed above, is similar to that associated with the casting of bells found by Blagg (1974) and Dungworth and Maclean (2004). It is regrettable that the finds from the pit in Easton were not systematically analysed before they were returned to the pit and covered over.

The process of bell founding was described by Theophilous in 1100 and by Biringuccio in 1540 (Blagg 1974, 133–4). The methods they described, although somewhat modified over time, with individual processes being jealously guarded by bell founders, remained little changed until the 19th century (Jennings 2006). Historic methods of bell founding

are described by Elphick (1988) and are recognised in the excavation report on San Paolo, Di Valdiponte by Blagg (1974).

Jennings (2006, appendix) reprints an article on *The Foundry or Foundry of Bells* which describes a bell founding process involving the creation of a 'false bell' from fine clay. This article, of unknown date and origin, reproduced in a 19th century reference work, gives information on the preparation of the casting-pit used in drying bell-moulds and the false bell; when dry the latter is removed from the mould, leaving a cavity between the core and the shell or cope for the casting.

Another process of founding a bell, the lost wax method, involved three phases: the manufacture of the moulds, the pre-firing of the moulds, and the casting itself.

**Phase 1.** A furnace was set up outside the church to produce the molten bell metal, and a shallow pit dug for the bell casting inside the church. A rough core was made over the pit from a wooden or other framework around a central iron rod or pivot. The core was then covered with layers of clay mixed with dung and then fine clay which was moulded to the internal shape of the bell by a strickle attached to the pivot (Fig. 10). When the clay was dry it was covered with sheets of tallow wax to the required thickness of the bell and again moulded to the outer shape of the bell by a second strickle. The wax bell then had the founder's stamps added to it with the wires that encircle the bell. Several layers of fine clay were then built up over the wax to form the cope or outer mould. Biringuccio recommended the use of templates first drawn on paper to shape the struckles and gives tables to determine the precise diameter and thickness of the bell for the required tone (Blagg 1974).

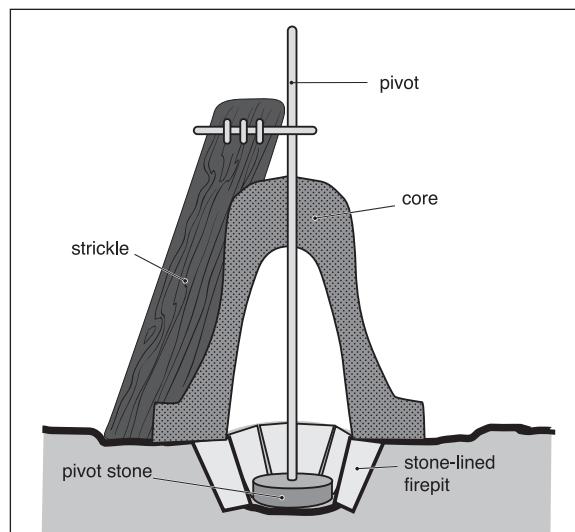
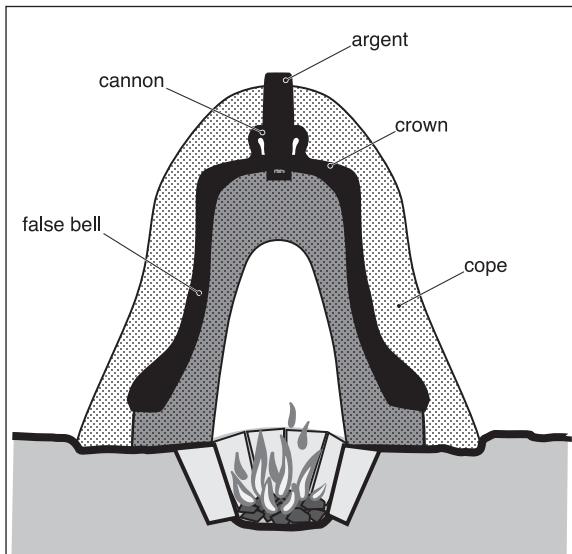


Figure 10. Section of bell pit showing the use of the strickle to form the core mould.

**Phase 2.** A wall of stone was then built around the mould and heaped with charcoal with a channel below for air. After this was lit, and the melted wax carefully channelled away for reuse, the furnace was covered with an insulating blanket of loam and turf and the mould 'fired for a day and a night'

until it was red hot inside (Fig. 11).



**Figure 11.** Section of bell pit showing the moulds with the cavity ready for casting over the bell-pit.

**Phase 3.** The wall was broken down before casting and the mound filled in with earth rammed down to hold the mould firmly. Molten bell metal was then carried from the furnace in crucibles and poured in through an opening, called the gate, at the top of the cope. The cooling period could last for several days to prevent cracking after which the cast bell was removed by breaking open the moulds and usually destroying the core (Blagg 1974; Jennings 1988; Elphick 1988).

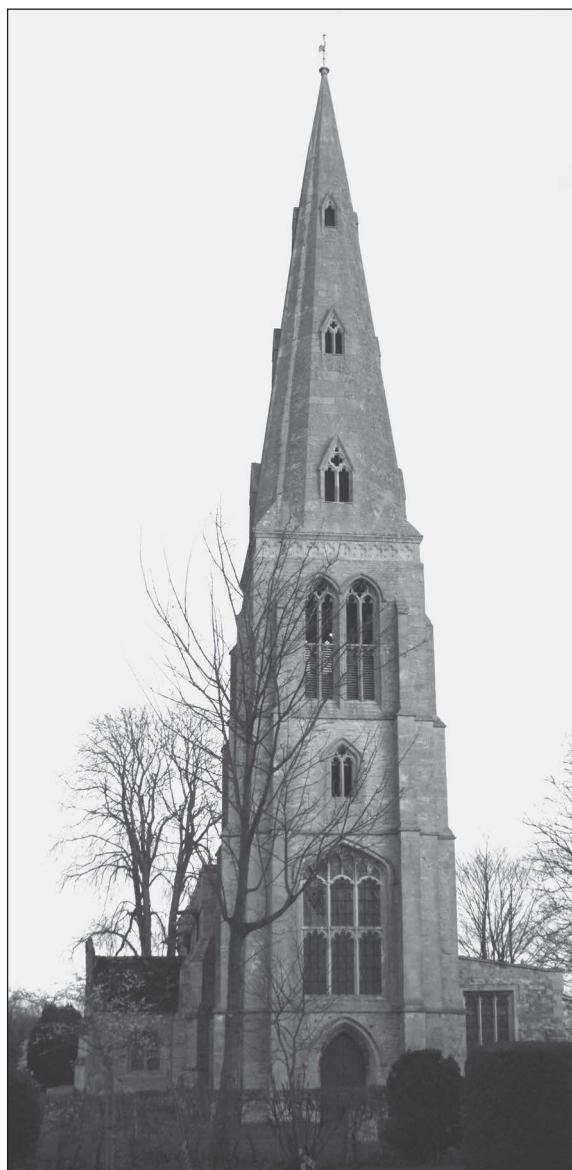
The lost wax method was superseded by the false bell method using fine clay.

#### Dating of the tower and spire, with the church alterations in the 15th century

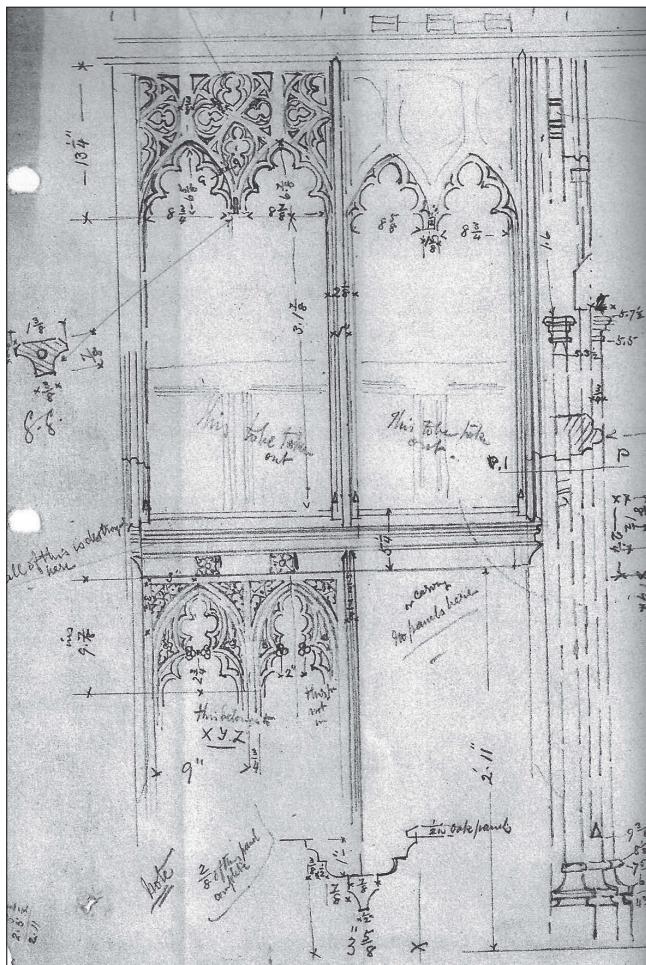
The tower was frequently the last element to be added or changed in the development of a parish church (Braun 1985). The tower in Easton church was added to the west end of the nave and has an unusually small plan with very elegantly proportioned details culminating in a broach spire with three tiers of spire-lights on the cardinal faces (Fig. 12). The tower and spire share similarities with other bell towers and broach spires in the area, particularly in the very fine, transomed, paired belfry-lights seen also at nearby Spaldwick, Keyston, Ellington, and Buckden. The great west window of the tower at Easton lights the nave and mirrors details in the 15th-century east window of the chancel. The tower arch handsomely reflects the Late Gothic period with evidence above it of the west nave wall of the former steeply pitched nave roof, altered in 1630. Recently, when the tower floor was replaced underneath the tower arch, the footings of an earlier, perhaps late 13th-century, west wall were uncovered in line with the arch (Davis 2010). The rood screen is 15th century (Fig. 13) (RCHM(E) 1926). The belfry stair has a distinct notch by the newel and treads that are severely worn by use. This

notch detail was noted by Woodger (1984) who attributed it to a 17th-century Mixed Gothic style, a date and style he gave to a number of Huntingdonshire towers. The belfry stair was built within the plan of the tower but projects as a buttress on the south-east corner rising above the belfry floor to the level of the bell frame. The rood stair has similar notches (Fig. 14) and was probably constructed by the same masons as the tower; the belfry and rood stairs are dated late 14th and 15th century respectively in RCHM (E) Huntingdonshire (1926) and Page *et al.* (1936).

Other changes in the church that suggest a period of alteration in the 15th century are the addition of the north porch, the replacements of the chancel east window, and two nave windows with similar details in style to the west window of the tower. The design of the western facade of the tower (Fig. 12) has the inverted proportions of other 15th century towers, e.g. Ellington, and Buckden (RCHM(E) 1926) where the



**Figure 12.** Easton Church west tower in 2014.

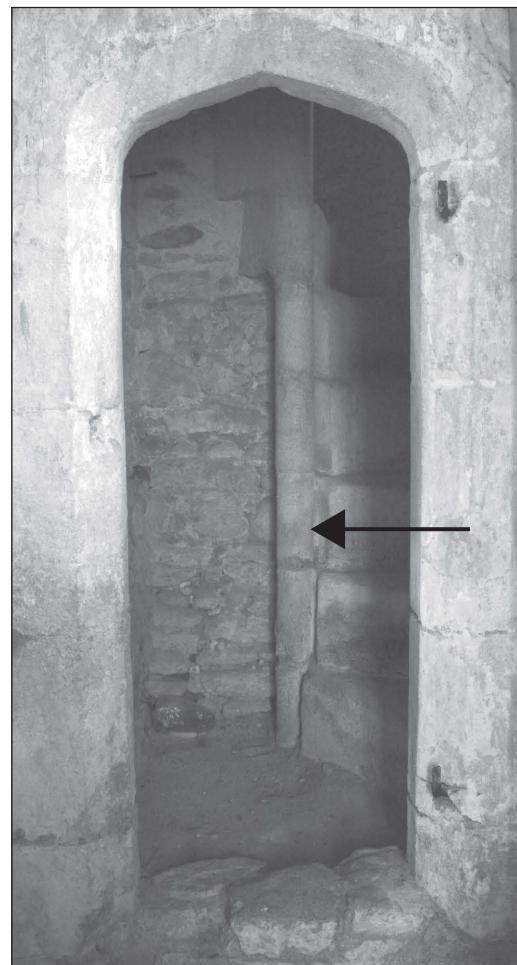


**Figure 13.** Drawing of the rood screen by John Ladds 1868, Norris Museum, St Ives.

west window is considerably larger than the doorway and has a smaller window above it and beneath the great paired belfry windows.

### Discussion and conclusion

The findings at Easton fit well with the cited descriptions of bell casting: the evidence of a heated shallow pit with a stone at the bottom that could have supported a pivot, the flare marks on the wall of the tower above 18 inches (0.45m), which could be explained by the protection from heat afforded by the earth mound that surrounded the moulds before casting started, while the debris in the pit of charcoal, dross, clay pieces and blackened sand and grease would be predictable remains from the whole bell-casting process. Sited within the tower the small temporary foundry would have had the necessary draught 'like a chimney' and be protected from the weather when preparing and drying the moulds. The massive floor



**Figure 14.** Doorway to rood stair showing notch to newel, 2014.

beams in the tower are ideally positioned to raise the cast bell with ropes and pulleys, and higher in the spire the cross beam would have provided a natural support above the belfry to hoist the new bell into its position in the bell frame. The west door in the church tower of Easton would allow easy access from the churchyard where a furnace may have been sited, and the tower would give protection for preparing and drying the moulds on top of the temporary casting pit.

The building of bell towers, porches and screens in the Late Gothic period is associated with the increased prosperity from the production of wool in the 15th century (Braun 1985), the pattern of alteration and change goes hand in hand with changes in liturgy which was to change with the Reformation (Duffy 1992). In Easton the alterations were completed by the recasting of the fourth bell by Newcombe bell founders of Leicester.

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## Glossary

**Bell frame and pits:** a wooden frame designed with pits [spaces in which] to hang each bell, formed of trusses designed to withstand turning the bells for full circle ringing.

**Cannons and Argent:** cast on the crown of the bell, the *cannons* are used for securing the bell to the headstock, the *argent* provides solidity to the crown. The cannons on the crown were called the 'ear'.

**Dross and Flash:** *dross* is the residue from the furnace skimmed from the molten bell metal, *flash* is the excess metal from the casting.

**Gate:** an opening for the molten bell metal to be poured into the mould, air vents are also made in the cope for escaping gases.

**Moulds:** the core and the cope are moulds that are formed to the shape of the bell.

**Pivot or stake:** a vertical rod inserted in the core, sometimes used to hold the strickle or compass as it turns to form and smooth the bell moulds.

**Strickle:** a board usually cut from timber and used as a template to precisely shape the bell moulds.

**Wheels:** attached to each bell and secured to the bell frame holds bell ropes for full circle ringing.