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(incorporating the Cambs and Hunts Archaeological Society)

Volume XC
for 2001

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Editorial

Last year's Proceedings followed the theme of landscape history and this one is even more tightly focused, concentrating on religion in Cambridgeshire in the last 2000 years. This is in celebration of the Millennium (which we all know is really this year). It also gives us a chance to show the breadth of the Society's approaches to the past, for papers include orthodox archaeological excavation (of a Romano-Celtic temple), a more unusual exploration of objects from the dust beneath King's College Chapel, and a survey of the architecture and history of all the bell-frames in the (old) County. We are also able to set out the 1291 Valuation of the Diocese of Ely, which will be of great benefit to medieval historians, to take a look at evidence for the fascinating topic of Anglo-Saxon minsters and to examine the truth behind the legends of St Guthlac of Crowland. For something quite different we have a final paper on a 20th century mosque in Cambridge, as multi-faith culture returns to Britain.

Alison Taylor

President's Address

The sudden death of Tim Potter early last year, and the sad loss of his scholarly interest in the Roman Fens, was acknowledged by CAS in two ways: through the lecture by his colleague and fellow excavator of Stonea, Ralph Jackson, and through selection of Roman Cambridgeshire as the topic for the March conference. The publication of the British Museum's epic volume on their investigations at Stonea and of this Society's volume on Roman Cambridge provided a new level of knowledge against which many recent excavations can be compared. The conference on Roman Cambridgeshire revealed how some had made sense of this new data, fitting it into the context known from previous research and testing established models with fresh evidence. A number of common themes seemed to run through the papers that were delivered at this conference, most notably the importance of East Anglia as the bread basket for the Roman Empire, exporting grain to its garrisons on the Rhine and Hadrian's Wall, the need to store and defend this grain contributing to the development of town defences in the 4th century as the burden of taxation for the local population became increasingly oppressive.

Cambridge Antiquarian Society needs to stimulate such synthesis and debate because the present system of excavation and reporting controlled by the needs of modern economic development has become formulaic, a mechanistic response driven by a planning process with little regard to furthering archaeological research or rewarding academic endeavour. It is essential that CAS encourages active involvement in archaeology by its membership (both amateur and professional), and combines this with knowledge and experience of members who come from other disciplines. The Society needs to act as an intermediary to encourage exchange of information so that clarity can be established, particularly with regard to major research questions. Cambridge Antiquarian Society has been a lead organisation in the study and preservation of Cambridgeshire's heritage for the past 160 years; the Society began the collections that led to creation of the Museum of Archaeology and Anthropology, and it was CAS who provided money for the first lectureship in Archaeology to be established at the University. Through its two annual conferences, its Proceedings and Conduit it is still the body that presents the results of excavations and other research to both the academic and public world, with dissemination of this information stretching to universities throughout the globe through its system of exchanging periodicals. Compared to such a record the recent vacillations in local government provision and legislative framework for protection of our heritage reveals how important it is to have continuity and democratic scrutiny. The Society is proud of its tradition of knowledgeable independence and must not be beguiled into believing it has no right to represent views at the highest levels when the need arises.

Tim Malim

Cambridgeshire Bell Frames

Robert Walker

This paper sets out the findings of a survey of bell frames in the old county of Cambridgeshire. It attempts dating in broad bands defined by documentary sources and identifies those frames which should be conserved. The paper includes a gazetteer intended to guide more detailed surveys.

The Purpose and Scope of the Survey

The systematic recording of bells in church towers has a surprisingly long history, and Cambridgeshire is fortunate in having a series of relatively complete surveys since the 16th century. The first was the 1552 survey of church goods. It was driven by very different motives from those of later recorders but, fortuitously, has left us a crucially important cursor[1]. In the 18th century, the inscriptions on bells were recorded by William Cole[2] and Francis Blomefield[3]. Their accounts are far from comprehensive but, like the Edwardian surveyors, they helpfully tell us how many bells were in each church. It was not until the middle of the next century that bells were viewed as important artefacts in their own right, when J J Raven published his survey in two editions in 1869 and 1881/2[4] (the last under the aegis of Cambridge Antiquarian Society). These works were relatively early contributions to the systematic study of bells and more recent studies, particularly those of H B Walters[5], have changed many of Raven's attributions. This is also apparent in Ranald Clouston's account of the more historically important Cambridgeshire bells, which brought yet more recent scholarship to bear on the misconceptions and errors in Raven's work.[6] It is, however, not a comprehensive survey of every tower, and we must wait for that full recasting and revision of Raven's inventory. In the intervening years Raven's errors were to some extent perpetuated in the great, but sadly unfinished, surveys of the Royal Commission on the Historical Monuments of England and in the Victoria County History (except where the notes on bells were provided by H B Walters).[7]

This is slow and stately progress, like a well-rung peal of Stedman Cinques on a deep and heavy ring. There, unfortunately, the analogy ends because even in Cambridgeshire the reader of the documentary history is faced by disjointed striking, inaccuracy and, when it comes to bell frames, an incomplete 'blue line'. In 1992 I was asked to take on the role of Bell Advisor on the Ely Diocesan Advisory Committee when Brian Threlfall retired. This was an interesting time in the field of conservation because a new code of practice on the care of ringing artefacts was being prepared by the Council for the Care of Churches which included a serious consideration of the value of bell frames. This was strongly driven by English Heritage, although bodies such as the Society for the Protection of Ancient Buildings had been protesting at the destruction of ancient frames for at least a century.[8]

That conservation depends on scholarship for legitimacy and force is seen in the way that the century of interest in bells was reflected in earlier codes which almost exclusively aimed to preserve pre-Reformation bells and their inscriptions. The whole emphasis of publications up to the present has been skewed towards bells, so that even in enviably comprehensive county bell surveys published in the previous ten years the descriptions of bell frames are sketchy and difficult to relate to a national context.[9]

The Council for the Care of Churches had drawn up lists of 'listed' bells to guide diocesan advisory committees, and there was general, if grudging, acceptance and accommodation of this measure of restraint by those active in ringing and bell hanging. The extension of preservation to bell frames was, and is, far from being accepted because the presence of an interesting frame may be much more limiting in terms of the improvement and augmentation of a ring of bells.[10]

The new code, *The Conservation and Repair of Bells and Bellframes*,[11] was published in 1993 but did not provide the conservation of bell frames with the empirical foundation which already existed for bells. It was hoped that a list of frames would be drawn up similar to the list of pre-Reformation bells, but that has not yet been published. Diocesan advisory committees began to see a great increase in bell schemes, generated by the impending Millennium and supported by Lottery money, from about 1996. It was that flood of schemes which made this survey a pressing necessity, so that simple questions about the extent of the survival of ancient frames could be answered, and the judgment of particular proposals to remove or abandon frames in the Ely Diocese could be set in context.

This is not to say that the study of frames is entirely new. It had not been systematically pursued in Cambridgeshire beyond brief notes in the RCHME surveys, but there is considerable work to draw on from elsewhere. The classification of frames was started as long ago as 1945 by George Elphick in his work on Sussex bells and belfries[12]. There was, in addition, a small body of publications by local archaeological societies[13] and unpublished work such as a survey of Essex frames[14]. The most important and influential work is that of Chris Pickford and Christopher Dalton[15] in the establishment of a rescue recording project from which came an attempt to establish a universal classification and recording system.[16] The emphasis on recording has, not surprisingly, struck a chord with archaeologists and some useful further material has come from the Institute of Field Archaeologists.[17] Clearly, what I present here is in debt to these authorities and I use, as far as possible, the Pickford system of coding in the gazetteer which follows.

The body of work referred to above has generated a broad typology which is summarised below. For judgments as to whether a frame should be removed or abandoned it was considered sufficient to establish the overall form, approximate date, completeness and quality of construction of individual frames in a way which would allow comparison. The survival of contemporary bells, for example at Bartlow or St Botolph's in Cambridge, also adds weight to the conservation case.

The refinement of the typology by a joint by joint, feature by feature analysis would have required far more time than was available given the pressure of Millennium schemes. It was therefore decided to establish a data base by collecting measured sketches and photographs of each frame and to go as far as possible with detailed recording given limited time. This has since been supplemented by research into documentary sources such as churchwardens' accounts. It is hoped that this approach will develop the general understanding of the survival and distribution of the types of frames and provide a sufficient and useful path for more detailed study, and dendrochronological dating, to follow. Further detailed work can now be effectively focused.

The frames of substantial merit are described in the text below and marked with an asterisk in the gazetteer. It is to be hoped that these frames will be preserved and not suffer the fate of the three bell oak frame at Teversham which is given as 'ancient' in the Royal Commission survey[18]. This frame has vanished without faculty or record to be replaced by a new frame with a single pit made of the meanest and ugliest metalwork encountered in this survey.

Bell Frames: an introduction to history and typology

The important elements of a bell frame are the number of pits[19], the number of bells and their dates[20], the way they are arranged on plan, the materials of the frame, the way it is shaped into a sufficiently strong entity by the joining together of vertical trusses, the form of those trusses and the nature of the supporting structure.

The number of bell pits in a frame is a powerful indicator of period. In 1552 87% of Cambridgeshire churches had either three or four bells.[21] Only five churches (2.5%) appear in the inventory as having five or more bells, and one of those records for Shepreth, which is given as having eight bells, is probably an error.[22] Not one of those ancient five pit frames survives. Perhaps more surprising is that only sixteen churches (9.5%) had as few as two bells and only three churches had only one bell. What we can say then is that two, three and four pit frames have the potential to be pre-Reformation but that frames with five and more are unlikely to be earlier than 1552 unless they are old frames which have been extended, as in the example at Duxford St John (Item 9 below and Fig. 3b).[23]

The above analysis is based on the numbers of (as they are often described) *greate belles* given in the inventories. In addition to these most churches had at least one *sanctus* bell (variously described as *saints bell, sakeringe bell, sancts bell*), and some also had *hande* bells. It is difficult to generalise about sanctus bells but it would not be unreasonable to say that they were generally modest in size. They played a part in the mass and were normally in a sanctus bell cote, as at Over, or in a separate frame within the church. At Cherry Hinton a parclose screen was used as a bell frame as William Cole found:

There is a 6th Bell which hangs on the North Side of the Nave, near the chancel, of a small size, called the Sanctus Bell and which I don't remember to have seen existing in any other church.... The old pulpit stands on a single pillar of wood against the first Pillar on the North East is the Desk under it, as usual, is the Saints Bell, as it is called near it, on the Top of a Division of a small Chapel separated and divided off from the East End of the North Isle, behind the Pulpit ... [25]

William Cole's great parochial survey in the mid 1700s reveals another interesting threshold in terms of numbers of bells. By then, the number of churches with three bells had fallen from 93 to 36 and the number of four bell towers from 52 to 35. Five bell towers formed the largest group of 60 (35%), but there were, as yet, only seven towers with six bells.[26] There were no eight-bell towers recorded by Cole in the middle of the 18th century[27] and only one with ten (Great St Mary's).

In the following century the number of six-bell towers increased to 22 but there were still only two eight-bell towers at the time of Raven's survey.[28] The creation of eight-bell rings, which now number 22, is very much a 20th century phenomenon, and in that time too the number of six-bell towers has almost doubled to 43.

The arrangement of the bells on plan raises few evolutionary questions with the pre-Reformation frames. Almost without exception two- and three-bell frames, and many four-bell frames, are formed by parallel bell pits contained between parallel *pit*

trusses. The ends of the pit trusses exhibit various degrees of bracing, to maintain their relative positions (see for example Fig. 2a). In this paper the term *end truss* is used but often it is a misnomer in relation to the early frames.

There are some interesting variations, such as the diagonally-placed frame at Hardwick (see Item 30 below and Fig. 10a–c), but the fact remains that in most cases placing up to four bells in a medieval tower presented no planning problems.

There are a very few examples of three-bell frames which have pits at right angles to one another (Coton and Little Abington: Fig. 7), but a larger number of four-bell frames which are arranged thus, such as Balsham, Elsworth, Great Abington, Horseheath, Little Gransden, Quy, and Thriplow.[29]

The more interesting four-bell form is that where the pits are arranged around a central square so that two bells swing in each direction (see Fig. 12)[30], for example Babraham, Barrington, Cambridge St Edward, Comberton, Fowlmere, Harston, Little Eversden, and Sutton[31]. This plan is very strong because all of the 'walls' of the frame are properly trussed by short pit trusses and great trusses which form a pit side and a pit end. The form has been ascribed early beginnings in a study of Norfolk bells, and appears to be an East Anglian specialty[32], although examples are known elsewhere. It was an enduring form, while four bells were considered to be sufficient, and continued in use for oak frames until after 1600. The frame at Sutton, for example, has been dated by dendrochronology to 1620 (see Item 41 below and Fig. 12).[33]

There are only two examples of bells being arranged on two levels before the 18th century. The four-bell frame at Little Downham of *c.* 1660 (see Item 54 below and Fig. 10e), and the two tiers of frames at Cambridge Holy Trinity are fine examples.

The arrangement of five and six bells on plan is subject to greatly increased possibilities. Pickford's classification identifies as many as 28 plan forms.[34] The commonest forms in Cambridgeshire have a simple range of three or four parallel pits with one or two pits at one end. These forms can come about as a natural extension of older frames but may be of one build from the late 16th century onward.

Turning now to the structures which support the bells, that is the framework of a bell frame, it is worth briefly considering the design parameters and function which shaped them. In all frames earlier than the beginning of the 17th century the bells were swung but not turned full circle[35] so that the forces generated by a bell in motion were about three times the weight of the bell vertically and one-and-a-half times horizontally. The loads arising from a bell of one ton, which would not be uncommonly large, are therefore substantial.

Bells can be hung from pairs of simple beams, but very few ancient examples survive because substantial timbers are required to avoid flexing, and it is difficult to resist the horizontal forces which punch the beams into the tower walls. There are no examples of this form in Cambridgeshire and few elsewhere. A refinement would be to prop the simple beams, and there are examples of this type of structure of early date outside the County.[36] Bells hung in space in this way would also be difficult to maintain unless there were a floor immediately below them.

It is then the demands for structural economy, a stable connection to the tower and ease of access which dictate the solution of a framed structure built on a supporting floor of beams, and it is this simple form which is common to all the ancient examples illustrated here. The floor might well have existed before the bell frame and, equally the 'floor' might consist of beams but no boards, but in all early frames this is the pattern.

The ideal foundation for a bell frame is a lattice of beams at right angles which are connected where they cross and firmly fixed into all four walls of the tower. This ideal is rarely found, and it is more usual with the simpler frames to find a single layer of parallel beams supporting two beams on which the ends of the frame trusses rest (see for example Fig. 3f). There are variations, particularly with larger numbers of bells, which are noted in the detailed descriptions below.

The parts of frames which have received most attention are the trusses or vertical panels onto which the bells rest directly. It is these elements which most clearly exhibit evolution, fascinating variety, regional idiosyncrasies and the rough wooden beauty which devotees of timber-framed buildings will know and understand. Indeed, there are many parallels between buildings and bell frames which might benefit from comparative study. The same scale of members and form of joints are obvious similarities. There were specialist bell hangers, for example Edmund Aleyn of Elsing at the beginning of the 16th century[37], but there is no evidence of their exclusive occupation, and the hanging of bells and the making of bell frames must have been but parts of the carpenter's repertoire alongside building roofs, houses and barns.[38]

There are two principal features of a truss which have significance for classification and dating. Firstly, the forms of the top member (the head), be it absent, short or long, appear to represent a pattern of change over time.[39] There are no ancient examples in Cambridgeshire of what is possibly the earliest form of truss, which consists of down-braced posts (like the king posts described below) with the bell bearing into the end grain of the posts.[40]

The next development is considered by most authorities to have been the short headed truss, of which there is one more-or-less complete example in Cambridgeshire, at Bartlow (see Item 1 and Figs 1a–c), apparently dating to *c.* 1440. This type of truss is thought to continue in use elsewhere well into the 16th century.[41] An important feature of these trusses is the horizontal transom which binds the down-braces together. It is evidence of the transom which may betray the later addition of a long head.

The majority of frames have long headed trusses which, to a greater or lesser extent, are joined together so that the whole frame is like a skeletal box or

timber-framed building. There are examples outside Cambridgeshire of short heads being replaced by long heads, perhaps to strengthen a frame,[42] and there are records of heads being replaced in the course of repairs[43] so that the age of the head of a frame must be viewed with suspicion.

The timbers supporting the head, in both of its forms, follow patterns which can be classified into families:

The king post (KP) truss (see Fig. 2).
The KP truss may well be the earliest, as a natural development of the headless trusses described above, but it continued in use alongside the scissors braced truss – indeed they appear side by side – until the 17th century when the simple A frame became dominant. The KP is easy to construct but suffers from a definite disadvantage in that the horizontal forces of the bell are focused on a single joint. This may be eased by short braces (jack braces) from the down-braces to the head (see Figs 2d and 2e), but there is still a tendency to rock when the frame shrinks and the joints become generally loosened.

The scissors braced A (SBA) truss (see Fig. 3).
The SBA truss is an East Anglian specialty which has improved resistance to horizontal forces because there are two major joints with the head.

The X truss (see Fig. 4).
This form appears to have been little used in East Anglia[44] but there are some interesting examples in Cambridgeshire, especially of the type with elbowed braces which meet just below the head of the frame such as Waterbeach (Fig. 4b).

The A truss (see Fig. 13).
This form came into its own around 1600 and continued to be used, with various arrangements of jack braces, until the present day. The 17th century form which has heavy, wide braces, which give enormously strong joints between the braces and the heads and sills, is common to the west, in Huntingdonshire, with dated examples as early as the 1630s. There are good, but fewer, examples in Cambridgeshire (for example at Haslingfield; see Item 49 and Fig. 13). This wide-braced form is known in other areas as late as 1701.[45]

There are also two important types of frames with high sides or superstructure (see Fig. 10). In one type there are posts and beams which arch over the heads on which the bells bear, but these upper beams are not intended to carry bells themselves. This form may be seen at Hardwick and Cambridge St Peter (see Items 31 and 32 and Fig. 10). In the later type there are bells at two levels so that the trusses have tall end posts into which two long heads are joined. This type may be seen at Little Downham (see Item 54 below and Fig. 10).[46]

There are other towers with bells at more than one level, but in these cases, for example at Waterbeach (see Item 14 below and Fig. 4b), there are two low-sided frames of distinctly different date and form. At Cambridge Holy Trinity there are three tiers of frames of similar date.[47]

While East Anglia appears to have almost exclusive use of the SBA truss it has very few examples of the family of trusses known as the queen post truss (i.e. a frame like the KP truss but with two posts rather than one). There is an excellent example of a frame composed of such trusses in the Ely Diocese at West Dereham, but in Cambridgeshire there is only a single truss at Little Eversden, which appears to be a post-Reformation alteration[48], and the frame of 1852 at Castle Camps.

Within the principal families of trusses there is the possibility of a multiplicity of variation in methods of jointing and the form and positioning of braces and end posts. The braces can be straight, curved or elbowed, and there are many possibilities for the form and location of jack braces. There are also features such as the long head which is shaped to show a 'false short head' where the bells have their bearing, and the posts can show variations in their form on plan and in the presence of and form of jowls. At present it is not possible to put dating limits on these features but dendrochronology may eventually show if they represent evolution.

One dimension which may, in broad terms, be date dependent is the height of the frame from the top of the sill to the top of the head. Taller appears to mean earlier but this must be tempered with the overall scale of the frame and the wealth of the church because smaller bells will tend to need a smaller and therefore lower frame. There was a good technical reason for this effect in that earlier bells tended to be taller and narrower than later bells.

Pre-1552 frames

The short headed frame

1. Bartlow

Bartlow is a remarkable ensemble of round tower[49], *interesting, untouched medieval peal*[50], and the only example of the short head frame in Cambridgeshire.

The bells are by William Chamberlain of London, thought to have been active 1426–56[51], and it would be reasonably safe to suggest a similar date for the frame and bells together. Such a date would be consistent with the range of dates for short heads given by Pickford as the 14th century to the early 16th century.[52]

The oak frame (illustrated in Fig. 1a–c) consists of four parallel trusses. The main braces on all of the original trusses are curved and slightly elbowed. The central two were probably both of SBA form, but the southern truss has been changed to a KP type with one jack brace.[53] The outer trusses are of simple, curved A form but have a, possibly unique, adaptation to meet the geometrical problems set by a cramped round tower. To get a frame of sufficient scale and strength without hollowing out the tower walls excessively the sills of the outer trusses have

had to be set closer to the inner trusses than desired. To achieve the necessary width of the pits these outer frames take on an ogee curve to make the pit wider at the top than at the bottom. Even so, the braces are deeply cut to allow the mouths of the bells to pass. The other problem caused by the round plan is the need for curved supporting beams and curved transoms. The transoms no longer exist[54] but they are betrayed by supporting haunches on the main braces and notches and mortices in the outer trusses. These outer mortices are arranged so that one end of each transom was restrained. They may also be unique to the situation in a round tower and probably reflect a desire to restrain the ends of a curved transom.

The long headed frame with parallel pits and king post trusses

2. Grantchester

Grantchester might almost be called an *intermediate headed* frame because the feet of some of the braces extend further than the heads on one side. The oak frame is tall (see Fig. 1d) and three of the trusses are of

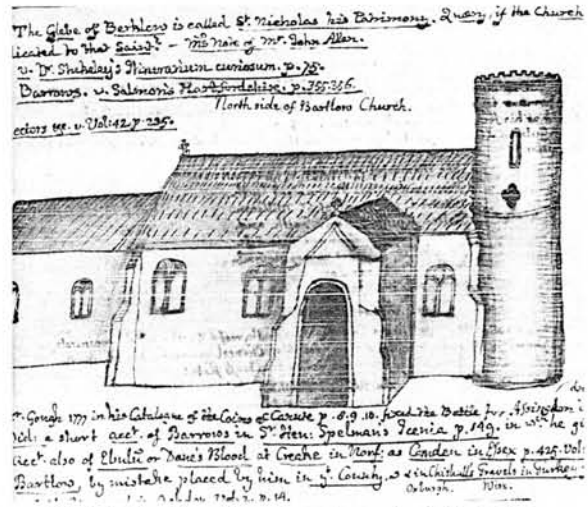
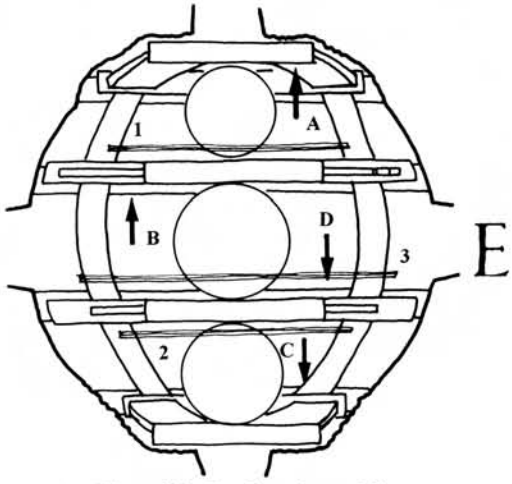
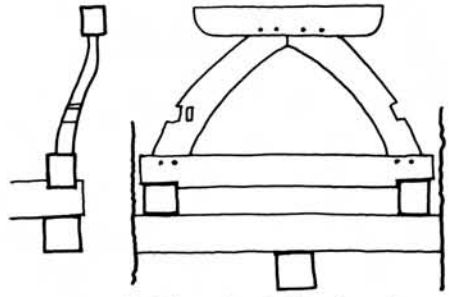


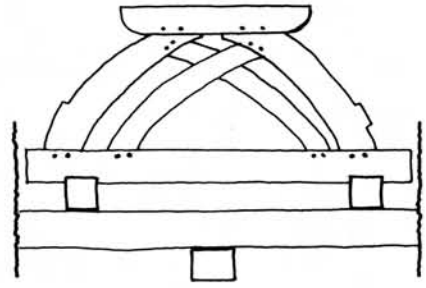
Plate 1. *Bartlow Church as drawn by Cole in the mid 1700s.*



1a. Plan of the Bartlow frame. View C is similar to View A. The truss on View D has been replaced.



1b. View A and side view of truss.



1c. View B

1d. Grantchester: view of the pit side of the western pit truss.

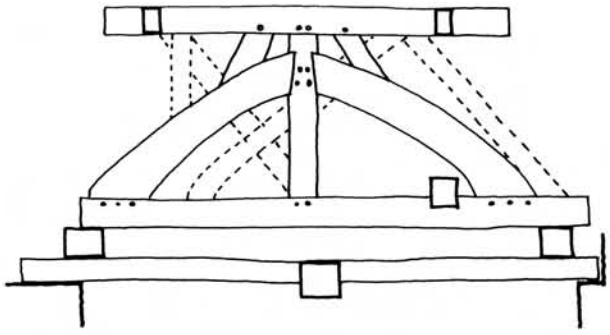


Figure 1. *Bartlow (1) and Grantchester (2). Numbers in brackets refer to the description of the frame in the text.*

KP form with jack braces which slope in at the top. The joint between the post and the massive braces is shaped so that the pegs are assisted in resisting shear forces by the post itself. One pit truss is of X form with curved braces which cross immediately below the head.

3. Longstowe
This oak frame (see Fig. 2a) is relatively tall and takes the simplest of KP forms, with curved braces from the sills to the post with no attempt to strengthen the joint between the post and the head. There were three bells in 1552, one of which survives. This is by Joanna Sturdy who was active in widowhood around 1460.[55] Unusually, the bells swing north-south which is the weakest axis of any tower.

The ends of the pits are framed with posts with jowls which face sideways to connect not with the heads of the pit trusses but with the rail of the end truss. The joint here is not unlike the reversed assembly joint found at the heads of posts in earlier medieval buildings.

Two bells by Christopher Graye were removed early in the 19th century and an unusual ring of tubular bells (by Harrington, Latham & Co) was constructed on top of the old frame in 1898.[56]

4. Parson Drove
The tower is a fine example of late 15th century work[57] the vault of which is designed around a large circular opening for hoisting bells. It is likely that the frame was built with the tower

This oak frame (see Fig. 2b) is of very similar dimensions to that at Longstowe described above. The principal difference is in the joints between the heads, the end posts and the rails of the end trusses which are much like the dovetail lap joints found at the heads of posts in timber frames buildings. Here the jowls of the posts face the bells and are jointed into the heads of the pit trusses. There are, in addition, corner braces between the posts and the heads. The end trusses, or at least what appears to have survived the later alterations of 1787 to make room for five bells, simply have curved down-braces from the end posts to the sills.

5. Newton (South Cambridgeshire)
This oak frame has the simple form of four, similar, parallel KP pit trusses with slightly curved braces. The trusses are distinguished by partly splayed joints between the posts and braces and by false short heads (see Fig. 2c). The pit ends are trussed by braces between end posts and a top rail. The known bell dates range from *c.* 1400 to 1603.[58]

6. Snailwell
The Snailwell oak frame (see Fig. 2d) is relatively tall and can probably be dated from the surviving medieval bell of *c.* 1480. This bell is from the Bury St Edmunds foundry.[59]

In this case the geometrical problems of the round tower are overcome by simply hacking away the flint work to make room for the long heads. The outer trusses are however, like Bartlow, much shorter than the middle trusses. There are no end posts and no end truss beyond the provision of a slightly curved (on plan) rail halved over each of the heads and hollowed out to give the bells more room to swing. The long heads are reinforced by the provision of inward-sloping jack braces.

7. Whaddon
This oak frame (see Fig. 2e) appears to be a three-pit frame of the 15th century which was altered, possibly in 1671, to take five bells. The tower is 15th century in style[60] and might follow the death and will of John d'Eschallers in 1469.[61]

The frame is distinguished by the massiveness of its foundations and the span and distinctive elbowing of the main braces of the trusses. There are five layers of timbers from the sills down to a 'floor' formed of thick planks.

It is suggested here that the king posts and braces of the three pit trusses are original and that the south side truss and the two short trusses along with all of the heads and jack braces are later. The problem with this contention is the closely related style of all of the trusses which would demand that the later carpenters follow the older work in style. A much more detailed analysis of this frame is required.

The long headed frame with parallel pits and SBA trusses

8. Cambridge St Michael
This oak frame is of exceptional quality despite having been hacked about in the 17th century to allow two bells to swing in the central pit. The pit trusses are relatively tall and are of SBA form, with scissors braces which are lighter than the main braces and nailed where they cross (see Fig. 3a). In addition there are end posts and corner bracing from the posts to the heads. These are the only trusses in the survey of this type. The ends are trussed in reversed assembly with X bracing across the ends of the outer pits.

9. Duxford St John
The three-bell oak frame is of modest scale but is exceptionally tall (see Fig. 3b). The scissors braces are of only slightly smaller dimensions than the main braces and there are end posts with jowls which face sideways across the pits. These form parts of an end truss of reversed assembly with curved down-braces from the inner posts to the lower sill. The frame was altered and extended, probably in 1777, to accept three additional bells, and may also have been moved closer to the south wall of the tower.

10. Great Eversden
This oak frame has been re-assembled and altered (probably in 1767 when the St Neots foundry provided two new bells). It differs from the Duxford frame in a number of ways. It is not as tall, and the scissors braces are thinner than the main braces (see Fig. 3e).

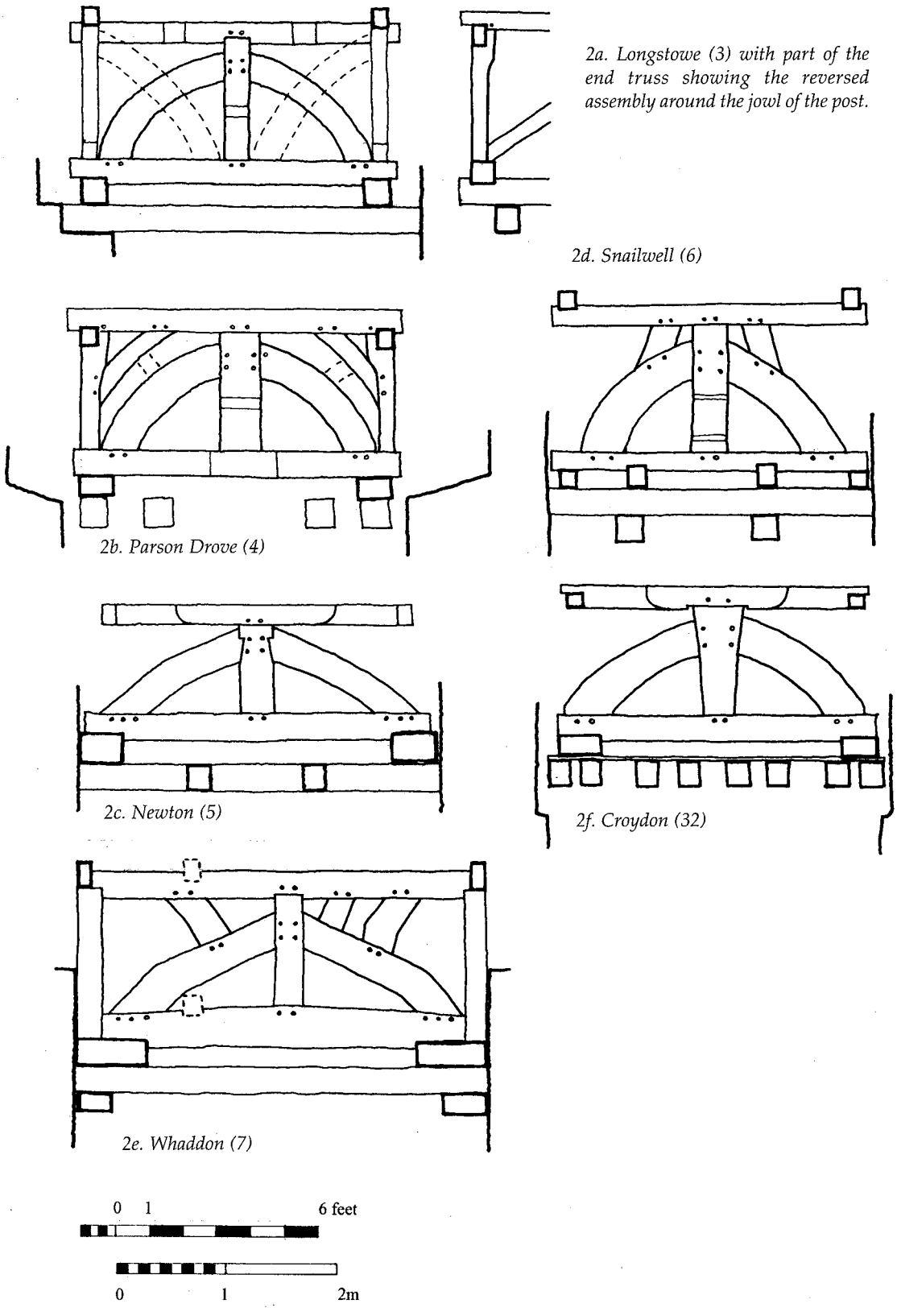


Figure 2. *King post pit trusses*
These pit trusses all come from frames with simple arrangements of parallel pits. With the exception of Croydon (2g) these frames have the same numbers of bells as given in the 1552 survey of church goods. Timbers that appear to be later additions are shown dotted. Numbers in brackets refer to the description of the frame in the text.

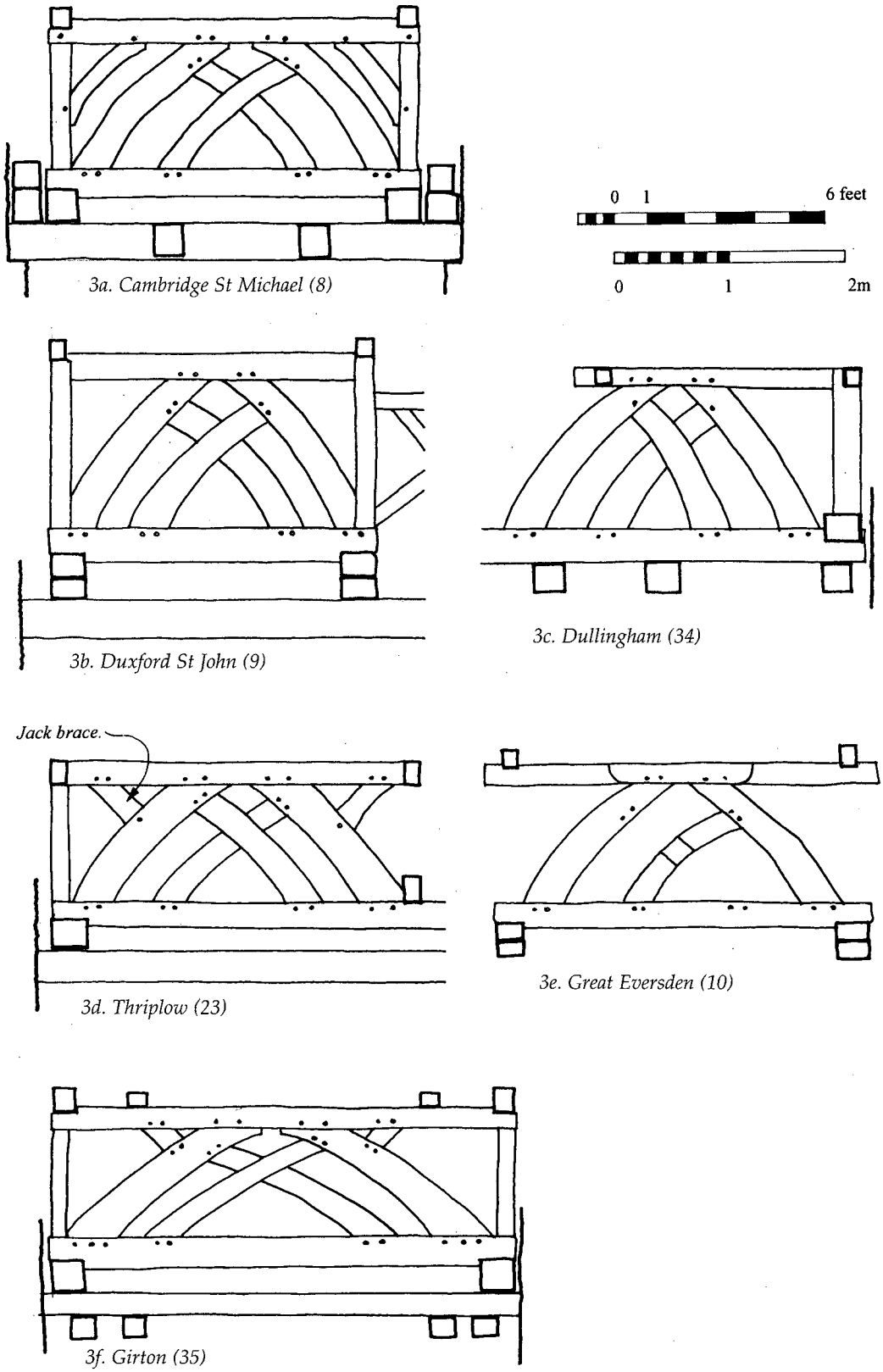


Figure 3. *Scissors braced A trusses*
These SBA pit trusses come from frames with simple arrangements of parallel pits. Frames 3a, 3b, and 3e have the same numbers of bells as given in the 1552 survey of church goods. 3c and 3f are, on the basis of the same survey, of post-1552 date. Thriplow (3d) is probably post-1552 or an early example of the use of jack-braces. Numbers in brackets refer to the description of the frame in the text.

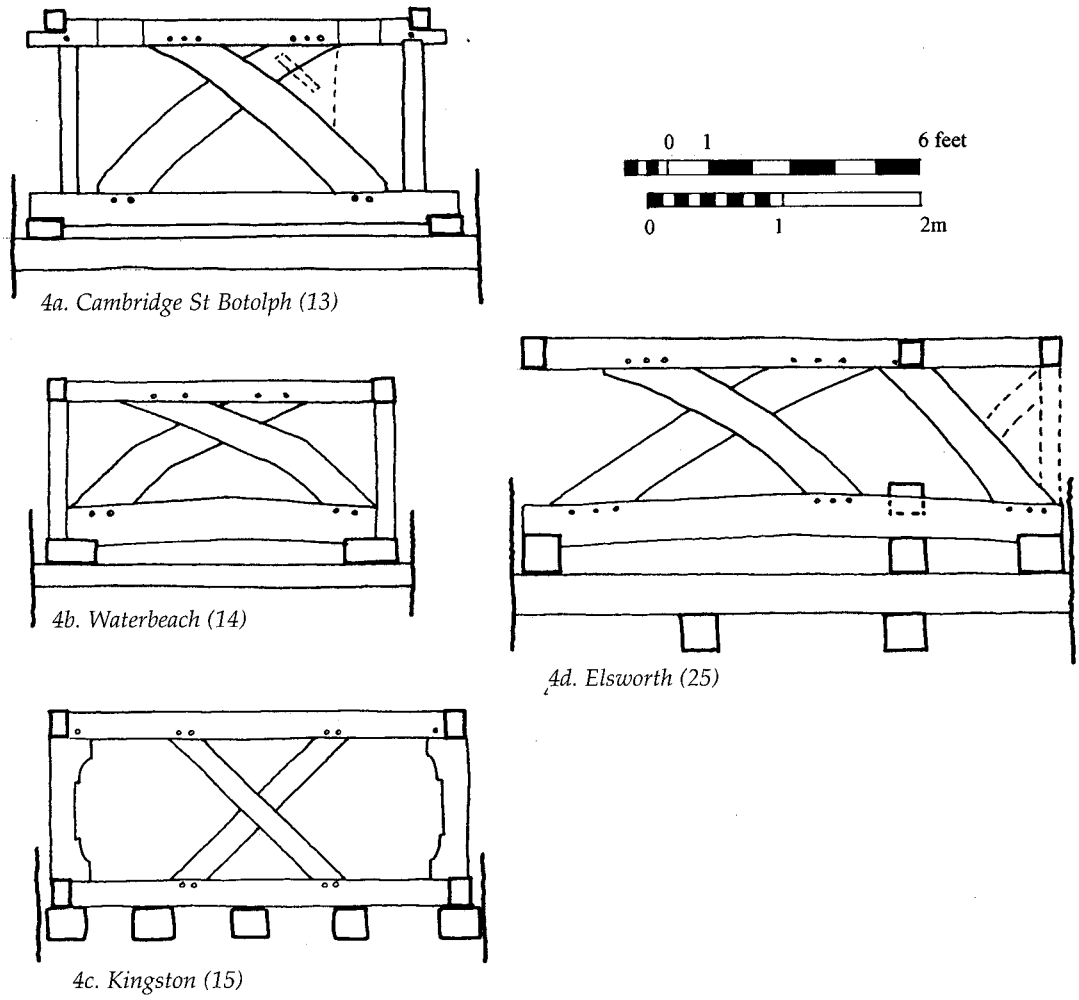
The end posts have jowls at both top and bottom, but the heads, posts and rail are, like Duxford, in the form of reversed assembly. The heads are carefully shaped on plan to give the swinging bell mouths more space. The centre of each has a false short head and the ends have a haunched cavetto.

11. West Wickham
One of the bells here is from the London foundry and probably dates from *c.* 1480.[62] The oak frame is in poor condition, much altered and was roughly dealt with when two additional pits were added on the east side.[63] It appears to have consisted of SBA trusses about 3ft high and about 11ft span. It probably had no end posts or end trusses. In the reconstruction and alteration there are corner posts and a weak attempt to brace the ends of the pits with upper corner braces.

12. Shepreth
All that survives here is the foundation for a three-pit frame and one original SBA truss.[64] The plates which are the immediate supporters of the trusses are unusually broad and thin, and the housings for the missing trusses are visible. There is no evidence of end posts so that this frame was probably of similar scale and form to that at West Wickham (above). There is only one pit now with two bells hung dead. The second truss is of X form with curved braces crossing just below the head.

The long headed frame with parallel pits and X and X trusses

13. Cambridge St Botolph
This four-pit frame appears to be the only ancient frame in this study which is not of oak. Judging by its distinctive reddish colour it is made from chestnut. The pit trusses are of X form with curved braces which meet just below the head (see Fig. 4a). The ends are trussed in a reversed assembly arrangement with unusual braces which join the sill and rail and pass behind the intervening posts.



4a. Cambridge St Botolph (13)

4b. Waterbeach (14)

4d. Elsworth (25)

4c. Kingston (15)

Figure 4. *X braced trusses*
These X pit trusses come from frames with simple arrangements of parallel pits except for Elsworth which has three parallel pits and one at right angles on the east side. All of these frames have the same numbers of bells as given in the 1552 survey of church goods. Numbers in brackets refer to the description of the frame in the text.

14. Waterbeach
The lower of two frames at Waterbeach has two pits formed by trusses with X braces. These braces are elbowed and intersect immediately below the heads. The ends are trussed with elbowed corner braces from the posts to the rail (see Fig. 4b).

15. Kingston
A 14th century bell by John Rufford of Toddington[65] remains here, and it is likely that this frame dates somewhere between 1460 and 1552 when there were known to be three bells. Bells were recast in the 18th century, and a date as late as that should not be discounted since none of the published authorities give any dating limits for this type of truss.[66] The height of the frame and the character of the oak timbers (see Fig. 4c) are however much more suggestive of a medieval date than of an 18th century one (compared with the much lower and lighter frames at Burwell and Burrough Green).

The pit trusses have straight braces with the top of the X narrower than the bottom, and there are end posts with massive and carefully shaped jowls (see Lolworth below). The posts, heads and end rail are jointed together and the end truss braced by top corner braces.

16. Lolworth
This frame has been greatly altered and was probably assembled in 1907 from older material. The importance here is the similarity with Kingston (above) in that the pit trusses have end posts with shaped jowls, and the heads, posts and rails are joined together in a similar fashion.

The long headed frame with parallel pits and king post and X trusses

17. Arrington
The present frame is probably the three-bell frame of 1552 but was remodelled in the 18th century.[67] One pit truss has been cut out, two are of KP form and one is of X form with the intersection just below the head. The ends are trussed with down bracing from the inner posts outward to the sills.

The long headed frame with parallel pits and other types of trusses

18. Cheveley
This oak frame appears to be a four-pit frame which was extended to take a fifth bell some time between 1552 and Cole's visit in 1752. Four of the trusses have a central post with X braces to either side,[68] and one is a simple KP truss with curved braces from sill to head. The end trusses are also unique in having end posts with a double jowl, which embrace the heads of the pit trusses. A rail is halved over each of these junctions (see Fig. 5).

The long headed frame of three pits with two parallel and one end pit

19. Little Abington
This is a singular plan form with a pair of trusses between the two parallel pits (see Fig. 7). The pit trusses are of X form with distinctly elbowed braces and the posts of the end truss and the trusses of the single pit have jowls at the top and bottom. These jowls are jointed and pegged into the heads, sills and rails.

20. Coton
This frame appears to be much altered but probably contains fabric from the pre-1552 three-bell frame. The end 'truss' of the parallel pits is formed by posts with thick jowls at the bottom.

The long headed frame of four pits with three parallel and one end pit with king post trusses

21. Shudy Camps
This frame has been much altered but contains three great trusses which are probably parts of the four-bell frame which existed in 1552. It may have been of the hollow square form (see Items 27–29 below), although it presently has the plan form of the title above. The trusses of interest have KPs and have unusual splayed joints between the post and braces (see Fig. 6, and Fig. 1d for a similar example at Grantchester).[69]

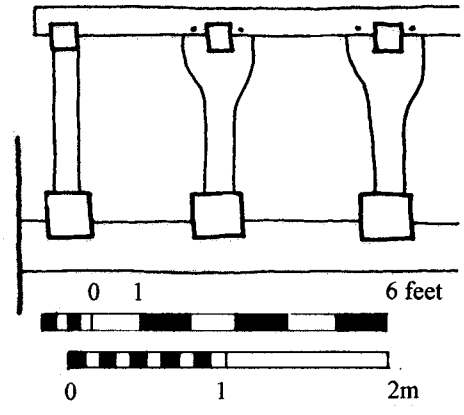


Figure 5. Cheveley: detail of the endposts.

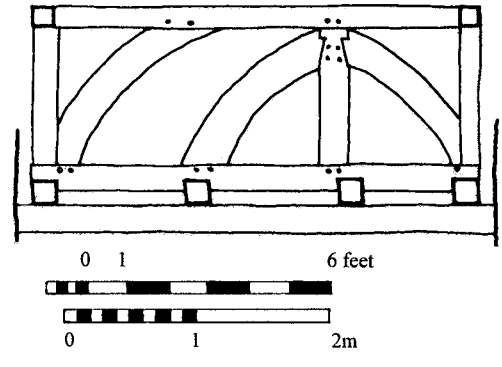
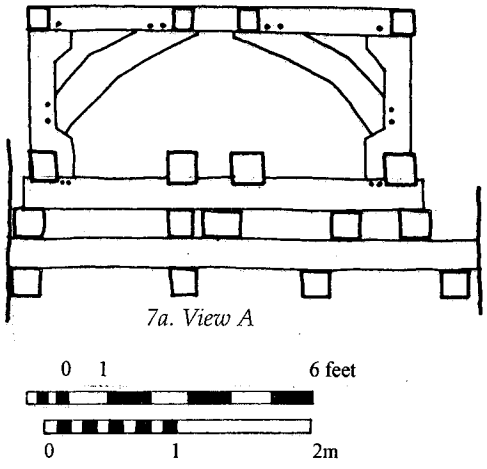
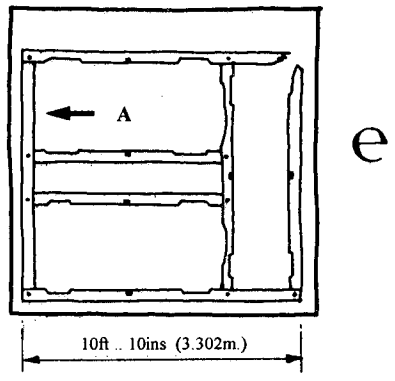


Figure 6. Shudy Camps (21)
Outer face of eastern great truss.



7a. View A



7b. Diagrammatic plan

Figure 7. Little Abington (19)

The long headed frame of four pits with three parallel and one end pit with SBA trusses

22. Balsham
This majestic oak frame has three parallel pits and a fourth across the west end. It probably dates from or before the middle of the 16th century, there being a bell by Johannes Tonne[70] surviving from this time. The frame was extended to take a fifth bell on the south side, possibly in 1609[71] when at least three bells were supplied by Richard Holdfeld of Cambridge (the original south pit was also narrowed at this time to give the new pit sufficient width). The frame held five bells before Cole's visit in 1742.[72] The special features of this frame are its plan form and exceptional height (see Fig. 8). The tops of some of the main braces are shaped to give extra contact with the head, which is not seen in any other Cambridgeshire frame, and most of the trusses have false short heads. The end truss is formed of corner posts, which display chamfers, with upward corner bracing to the rail.

The frame is now out of use and the bells are hung in an iron frame lower down the tower.

23. Thriplow
This frame is in poor condition, much altered and difficult to read. There were four bells in 1552, and it is likely that the arrangement on plan was as existing. There is one truss which is more or less intact and that is of SBA form with jack braces (see Fig. 3d and 3f for a similar example at Girton). These jack braces may indicate a post 1552 date. The other trusses are much altered and are either unclassifiable or of SBA form.

24. Great Abington
The arrangement here is of a three-bell frame with a fourth bell hung between the south end truss and a small truss fixed inside the south window jamb. There are a number of interesting features. The trusses are quite tall, the scissors braces are rather lighter than the main braces and there are false short heads. The trusses span only 8ft on to broad, thin plates and the north end has a gallows arrangement which, if original, could be the earliest of the few examples of the gallows end in this survey. The south end truss which forms a pit truss and the small truss inside the window opening are of KP form.

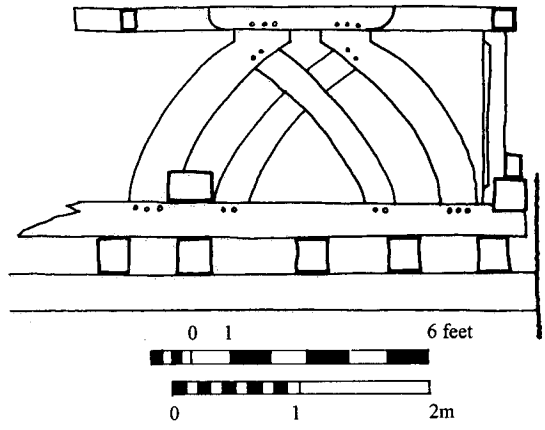


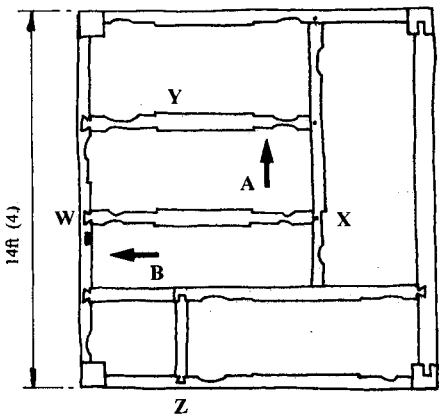
Figure 8. Balsham: east side of western pit truss.

Raven said that there were pits for five here but there is no evidence for more than four.[73]

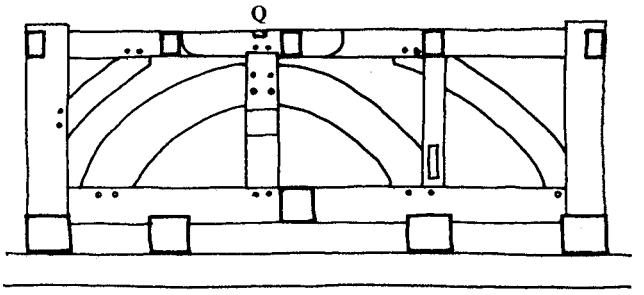
The long headed frame of four pits with three parallel and one end pit with X trusses

25. Elsworth
There were four bells at Elsworth in 1552 and there are four pits today. The massive scale of the frame (see Fig. 4d) and the simple curved X braces suggest that this is the pre-1552 frame, but there are bells of 1616 and 1628 which could mark the provision of a new installation. The end trusses are characterised by very stout end posts and massive, slightly elbowed braces from sill to head.

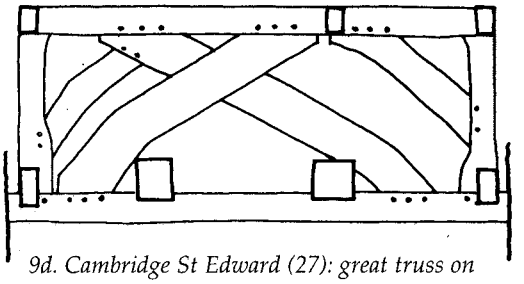
26. Wicken
The Wicken frame is much altered, probably *c.* 1910,[74] but appears to fall under this heading of four bell frames. There were four in 1552. The trusses are unclassifiable but are quite tall and have various arrangements of intersecting straight bracing or simple curved X bracing.
The bell dates range from *c.* 1480 to 1703.



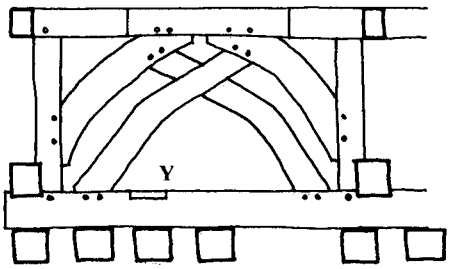
9a. Babraham (27): diagrammatic plan. The truss on W–X was originally on Y–Z.



9c. Babraham (27): great truss on View B. Q indicates false short head and original bearing.



9d. Cambridge St Edward (27): great truss on west side of frame.



9b. Babraham (27): pit truss on View A.

Figure 9. *Hollow square frames which appear to be pre-1552. Numbers in brackets refer to the description of the frame in the text.*

The long headed frame with four pits arranged around a hollow square

With KP and SBA trusses

27. Babraham
There were four bells in 1552, but at least two bells were recast in 1615 and it is not impossible that this frame dates from that time. Later alterations to form five pits make the original hollow square form difficult to see, but it is betrayed by empty joints in the sills and in the head of one of the shorter truss which has been moved (see Fig. 9a–c). The trusses are of consistent design and combine in a way which is quite unlike any of the other hollow square frames in the survey. The great trusses are of KP form with elbowed braces and have end posts with upper corner bracing. The corner brace on the one side where it crosses a pit end is substantially larger than that at the other end (close to the king post). The shorter internal trusses are all of SBA form.

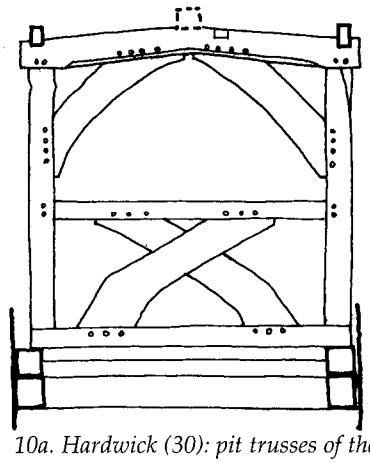
With SBA trusses

28. Barrington
The Barrington frame is known to have been of this form from Raven's survey.[75] There were four bells in 1552, but four bells were cast in 1627 by Miles Graye and William Harbert which could represent an alternative date. The frame was wholly remade in 1872 but one of the short pit trusses survives. This survivor is of SBA form and is relatively squat.

With X trusses

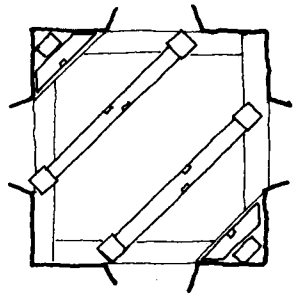
29. Cambridge St Edward
The interpretation of this frame has been made more difficult by recent alterations which were not preceded by consent or recording. The frame is tall and the timbers generous. The great trusses are asymmetrical and based on the X form but have very irregular secondary bracing which defies classification (see Fig. 9d). The short pit trusses are of X form with curved braces intersecting just below the head.

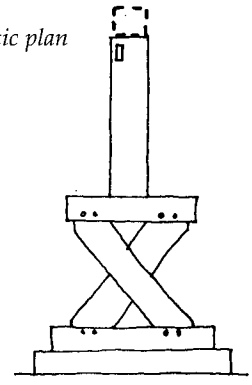
There were four bells in 1552 of which one survives.[76] At least one was cast in 1576[77] but the scale of the frame and the absence of the well organised system of posts and trusses which characterise the early 17th century versions of the hollow square frames described below (at Comberton and Fowlmere) suggest that this frame is pre-1552 in date. This may represent the early development of the hollow square plan in this county.



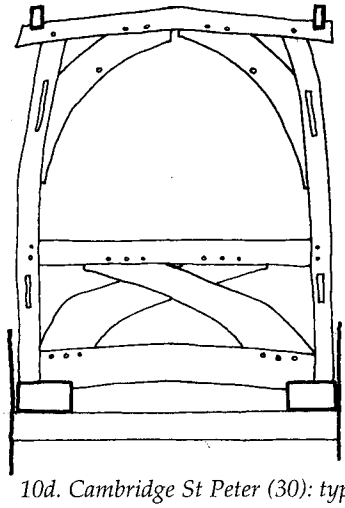
10a. Hardwick (30): pit trusses of the central pit.

10b. Hardwick (30): diagrammatic plan of the frame.

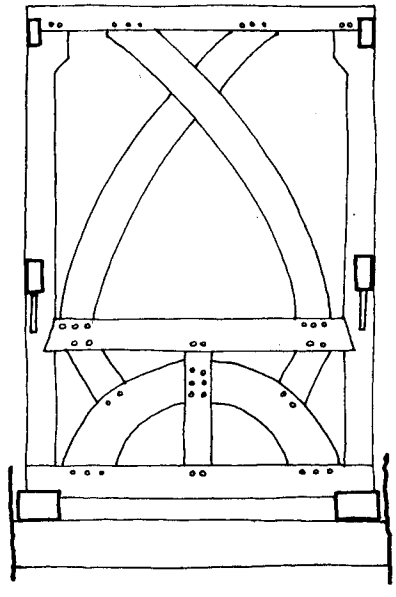


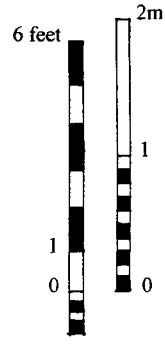


10c. Hardwick (30): outer corners of the frame.



10d. Cambridge St Peter (30): typical frame.





10e. Little Downham (55): pit truss (restored).

Figure 10. *Frames with superstructure. Numbers in brackets refer to the description of the frame in the text.*

Pre-1552 frames with superstructure

30. Hardwick

This three-bell frame is distinguished by its three-dimensional form and by its setting-out on the diagonal of the tower. The pre-1552 date is assumed from the number of bells in the 1552 survey. The tower was built *c.* 1400.

The tenor pit in the centre is formed by two trusses of similar form with elbowed X braces below the member on which the bells bear (see Fig. 10a–c). The end posts continue up past this member and are joined by a cambered beam. There are corner braces between the posts and upper beam. At the ends of the pit are X braces between the posts and a binder halved over the upper beams. The outer trusses are simple and short X trusses behind which a post rises to carry a beam which connects both posts with the upper beams of the central trusses.

The nave and chancel of the church have very fine queen post roofs of the 15th century.[78] It is pleasing to suppose that the well-constructed frame is by the same hands.

31. Cambridge St Peter

This two-bell frame is a delight (Fig. 10d). The posts of the pit trusses are full height and the frame is therefore of one build. Those enclosing the west pit curve inward towards the top. The lower part of the pit trusses has elbowed X braces and the upper part has large, curved corner braces. The end 'trusses' have curved corner braces.

31a. Cambridge Holy Trinity: see Addendum

Post-1552 frames of old style

With KP trusses

32. Croydon
The Croydon frame is placed here because the 1552 inventory gives only two bells. It is possible that a three-bell frame was built in the expectation of a further bell, and the character of the frame suggests that this might be so. The frame is of oak with three fairly tall KP pit trusses (see Fig. 2f). The posts, one of which tapers towards the sill, and braces are relatively heavy and there are false short heads. The trusses rest on a broad, thin sill. The ends are carefully trussed by corner posts with jowls which are jointed into the end rail and braced with upper corner braces.

33. Horseheath
The frame has three parallel pits and one across the east end. The southern pit has been extended into the eastern to accommodate a fifth bell. The trusses are of oak, relatively low and all of KP form with substantial posts and braces. The end truss, like that at nearby West Wickham, has a rail which is jointed to the heads supported by a simple A of straight braces. There are no end posts to the pit trusses.

As with Croydon (above) this frame is ascribed to the 17th century because the 1552 survey only records three bells. In this case there is the additional evidence of a bell of 1606

With SBA trusses

34. Dullingham
This oak frame has four parallel pits and a fifth at the north end. It was altered in 1902 to form a sixth pit within the two central parallel pits but no sixth bell was added. The trusses are relatively tall and of SBA form with curved braces (see Fig. 3c). There were four in 1552 and five when Cole visited, and the frame appears to be of one build. The dates of 1626/7 of the two Draper bells are probably the date of construction.

35. Girton
This oak frame of four parallel pits probably dates from the early 17th century, there being Norris bells dated 1617 and 1619. The span of the trusses is exceptional at 13ft and the visual impression is of massiveness. All of the trusses are of SBA form but one has jack braces (Fig. 3f). It is possible that the trusses without jack braces are the trusses of the pre-1552 three-bell frame. The trusses have end posts which are braced together to form an end truss with reversed assembly. The corner posts have jowls facing across the pits.

36. Little Wilbraham
There were four bells in 1552 which had been reduced to three by Cole's visit. The bells date from 1575/6[79] and 1604[80] so that this frame of three parallel pits is probably datable to the end of the 16th century. Two of the trusses are of simple A form with curved braces, one is of SBA form and one is a modern A truss. The end trusses have posts of L section which are braced to the rails.

37. Gamlingay
Bishop Alcock hallowed two new bells here in 1490, and it is likely that the SBA trusses date from this time. The frame, probably reconstructed for five bells, dates to 1653 (the date of the Miles Graye bells). The trusses are essentially of SBA form with jack braces, but the northern great truss is of distinctly muddled form. The unusual and visually impressive feature of the frame is the formation of gallows ends, which are used to make the most of limited space (see Fig. 11).

With X braces

38. Witcham
The tower was rebuilt in brick in 1691, and it is likely that the frame is of that date.[81] The trusses are relatively tall and are all of simple X form with curved braces. The corner posts have distinctive jowls. There are four pits but no evidence of the hanging of more than the two bells recorded in 1552 and by Cole.

Of hollow square form

39. Comberton
The frame is placed here because the 1552 survey only records three bells (but as noted elsewhere there could have been a spare pit). The two bells of 1633 by Miles Graye may suggest the date of construction.

The trusses are all of KP form with jack braces (see Fig. 12b). The elbowed form of the main braces and the asymmetrical arrangement of jack braces on the great trusses are remarkably similar to the frame at Whaddon (Item 7 above and Fig. 2f). The internal posts are notched over the highest level of sills, and this appears to be a detail of similar frames at Fowlmere and West Walton, just over the county border.

The frame has recently been repaired and is an impressive survival which can be seen from the chamber below. The parish should be applauded for this enlightened scheme.

40. Fowlmere
The Fowlmere frame is probably the most visually impressive frame in this survey. The great height of the frame and the scale of its components are exceptional. As with Comberton (above) it is ascribed to the 17th century because there were only three bells in 1552.[82] This frame is very similar to the frame at West Walton in Norfolk[83], in that all of the truss junctions are effected with posts into which the heads are jointed, and the great trusses have a composite form with a KP and a single brace, both of which have a single jack brace. These characteristics distinguish the Fowlmere frame from Comberton, but they share the way in which the internal posts are notched over the highest layer of sills.

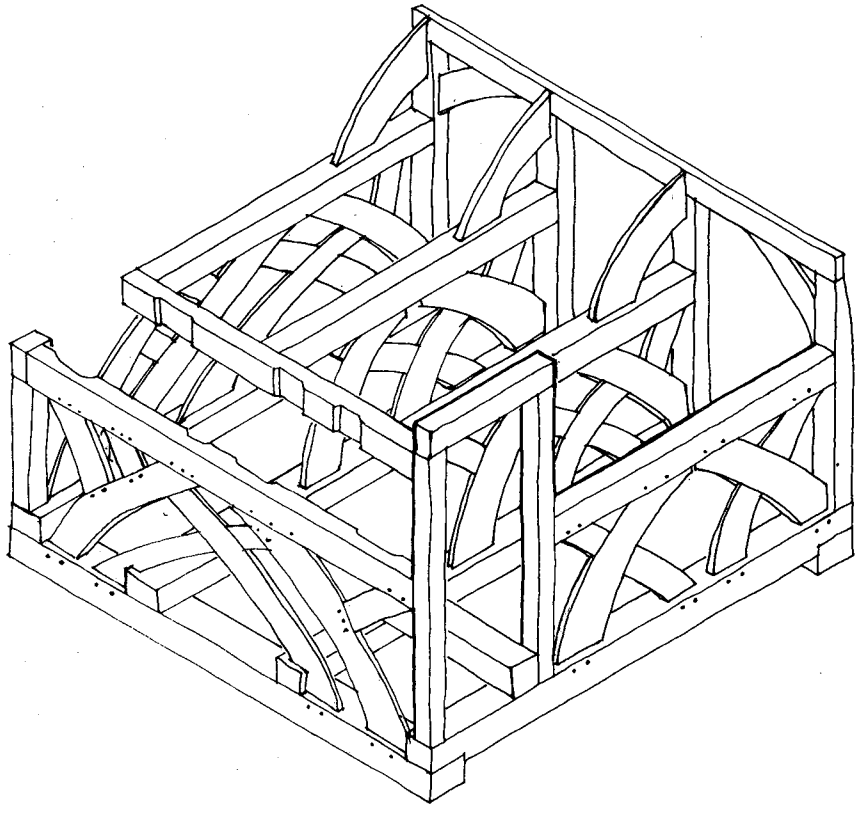
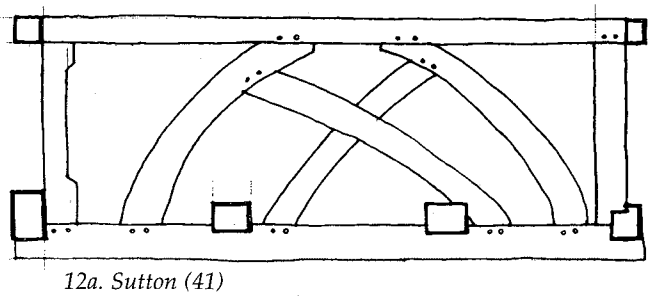
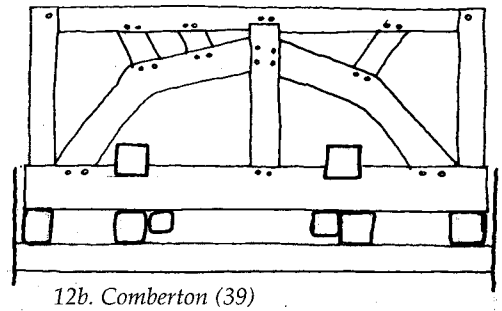


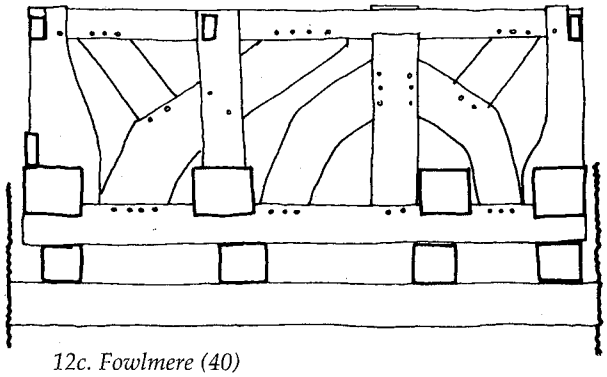
Figure 11. *The gallows frame at Gamlingay (37). Modern additions and iron frame for the treble omitted. The frame is approximately 13′ 3″ (4.040m) square. Numbers in brackets refer to the description of the frame in the text.*



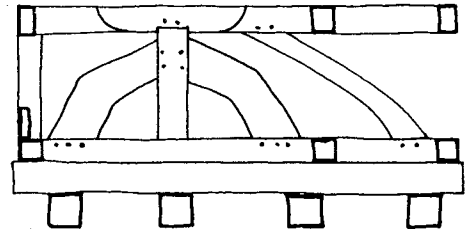
12a. Sutton (41)



12b. Comberton (39)



12c. Fowlmere (40)



12d. Harston (45)

Figure 12. *Trusses from four-bell frames of hollow square plan form. Numbers in brackets refer to the description of the frame in the text.*

The quality of design and construction displayed in this frame are magnificent. The interplay of members at complicated junctions, which can be seen on Fig. 12c, puts this frame in a class of its own.

41. Sutton
The frame is exceptionally tall (see Fig. 12c) and has trusses of SBA form without jack braces. Both of these characteristics would suggest that this is the frame which carried the four bells recorded in the 1552 survey. The frame has, however, been dated by dendrochronology to *c.* 1620.[84]

42. Dry Drayton
The frame was probably built between 1552 and Cole's visit in 1745. The foundations take the form of a hollow square and the details of the trusses, and particularly the locations of shaped intermediate posts, suggest that this was the form described by the trusses. The frame is relatively tall and the trusses are of curved X type. The distinguishing features here are shaped intermediate posts and corner posts which are of L section with massive, jowls at their bases.

43. Little Eversden
Probably built in 1629, which is the date of two of the surviving bells. The trusses are of curved X form with their crossing close to the head of the truss. The corner posts are shaped like the intermediate posts at Dry Drayton (above). The south truss is of different form and is divided into three parts by four posts. The central part is X braced and the outer parts have inward-sloping braces from the sills to the posts. A single queen post truss frames the inner side of the tenor pit, but its modest scantling and sawn finish suggest that it is a later introduction.

44. Cottenham
The tower fell in 1616 and was rebuilt, partly in brick, in 1617. The frame is very tall and heavily built and appears to have been of the hollow square type. It is now much altered to accommodate six bells of 1800. The lowest members of the trusses take the hollow square form on plan and there are stout posts at the corners, at the internal intersections and in the centres of the four external great trusses. There are varying patterns of bracing in each truss but the internal trusses generally have curved X bracing between the inner posts and a single brace where a pit end is formed. The outer trusses are of KP form with irregular secondary bracing. This pattern of posts provides a support grid allowing some freedom about the arrangement of the heads.

45. Harston
Perhaps the most modest of the hollow square frames in scale. This oak frame has short pit trusses of KP form with elbowed braces and great trusses of asymmetrical form with a KP to the pit side and a brace from post to head at the pit end (see Fig. 12). Some false short heads and much later iron and wood reinforcement. The increase in the number of bells from 1552 to Cole's visit suggests a post-Reformation date. The bells suggest perhaps 1634.

The 17th century: 'later' forms of the long headed frame

46. Caldecote
The frame is of oak with simple A trusses with wide braces. There are no end trusses but the upper and lower rails are jointed to the heads and sills.

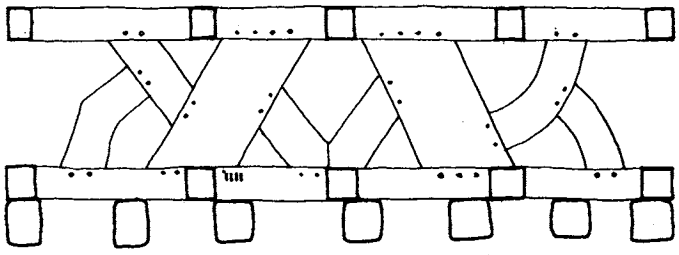
47. Great Chishill
The frame is dated 1657 and consists of trusses with simple but substantial A braces with jack-braces. It has affinity with dated Huntingdonshire frames of the same period.

48. Cambridge St Bene't
The frame was rebuilt lower down the tower by Taylors of Loughborough in 1931 but it appears that the substantial trusses were reused. The principal A braces are of massive breadth in common with Haslingfield and dated Huntingdonshire frames of the 17th century (see Fig. 13b).
This was one of only two six bell frames in Cole's journal.

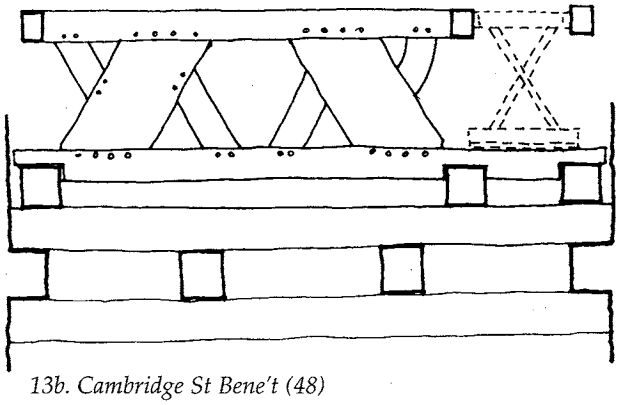
49. Great Shelford
The dating of this frame is uncertain. There were five bells by the mid 18th century and the known bell dates span from 1590 to 1670 (before the recasting of two bells in the late 19th Century). The plan form is simple with three parallel pits and a double pit at the west end. The great trusses have straight X bracing between end posts and a central post, while the pit trusses are essentially of KP form with secondary bracing which makes an X with each main brace. The tower was rebuilt in 1798 but the frame could be re-used.

50. Haslingfield
Haslingfield is the best example in Cambridgeshire of the frame of heavy A braced trusses which is relatively common in Huntingdonshire.[85] It is exceptionally heavily timbered and in this case the massive braces are accompanied by a variety of straight and curved jack-braces, some of which are themselves braced (see Fig. 13). There must be some doubt over the 17th Century date ascribed here since the 18th Century records are not certain. Cole gives four in 1743[86], which would tend to suggest that the frame postdates his record, but Blomefield gives five in 1728[87] which would suggest that this could be a 17th Century frame.

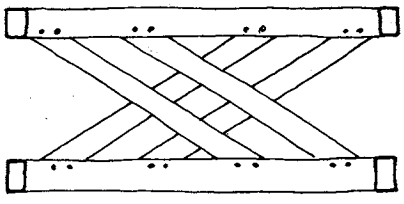
The dating of this type of frame will remain uncertain until further research and dating methods can be applied. It may be that the style is stable in form over a long period. There is a frame of similar scale, with double jack-braces at Eynesbury, which could be as late as 1810[88] and the bells at Haslingfield and Eynesbury are both by Robert Taylor of St Neots. The date given here for Haslingfield must therefore remain tentative.

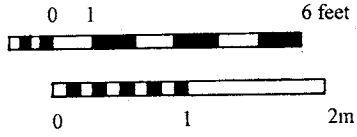


13a. One of the end trusses at Haslingfield (50).

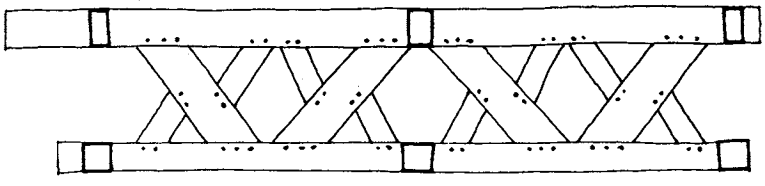


13b. Cambridge St Bene't (48)





13c. Hauxton (51)



13d. Burwell (56)

Figure 13. *Haslingfield, St Bene't, Hauxton and Burwell.*

51. Hauxton
The Hauxton frame has pit trusses with double X braces which interlace (see Fig. 13.c). The ends of the frame are trussed by a single X brace between two end rails into which the heads and sills are in turn jointed. The double tenon form of this joint is another distinctive feature of this frame. There is no other example of this form in Cambridgeshire, Huntingdonshire[89] or Essex[90]. It has been placed in the 17th century here because there are three bells of one casting by Miles Graye which are dated 1666. The frame is however relatively tall and it is not impossible that this frame is the three-bell frame which stood in 1552.

52. Milton
Milton is unusual and difficult to classify. It is put here tentatively because it has three pits which corresponds with the known number of bells as late as Cole's visit in 1744. The unusual features are the plan form which has a vacant 'pit' for access and a short pit

for the tenor bell which necessitated the use of a gallows end to make the best of the restricted space. The trusses are roughly of XX, AY and X/ forms.

53. Papworth St Agnes
The tower was rebuilt in 1848, but the frame appears to be reused.[91] Raven recorded two Norris bells of 1637[92] and it is possible that the frame of three pits dates from that time. The pit trusses have simple, broad A braces and the end trusses are similar with the addition of jack braces.

54. Quy
The five bells are dated 1670 which is probably the date of the frame. The trusses are tall with rather thin internal and end posts and braces in a variety of patterns.

The 17th century: two tier frames

55. Little Downham
This frame is of oak and probably dates from 1659, when (at least) two rather poor bells by Robard Gurney were installed.[93] The frame is of one build with full-height posts and the pit trusses are as illustrated in Fig. 10e. The king post with jack braces form of the lower part of the pit trusses would appear to support a date in the 17th century. The upper part of the pit trusses is formed by huge, curved X braces which cross just below the head. This was inherently unstable and led to numerous attempts to strengthen the frame. The end trusses have a rail just below mid-height, and two sets of braces are used to connect the centre post with the mid-rail and the end posts with the sill. These also proved to be flimsy and have been greatly altered. The bells are now hung dead.

The 18th century

56. Burwell
This frame is of considerable importance because the estimates and accounts of its construction survive.[94] The frame for five bells was completed in March 1784 by William Faircliffe Jnr. The oak frame and all of the fittings cost £86.5s.10d.

The trusses all take the form of various combinations of raking braces with double jack braces as shown in Fig. 13d. This form can also be seen at Waterbeach (upper frame) and Landwade, both of which appear, from the William Cole records, to be of the 18th century. Similar trusses continued to be constructed into the 20th century with the frames made by, for example, Day and Sons of Eye (Chippenham, which was constructed in 1898 is representative of their work).

The 19th century

The 19th century saw the introduction of iron frames of various forms finally evolved into the simple A and H frames which are used today. One is of particular importance:

57. Sawston
The 8 bells were re-hung in a new frame by John Taylor and Co of Loughborough in 1891. To fit 8 bells into the 11ft square of the tower required the use of iron H frames which rest on timber beams, which are linked by ironwork, rather than resting on the usual iron grillage. The low side frames are cast iron and were made to a unique pattern which has, unlike every other metal frame, real visual quality. The combination of high and low iron frames and the mixture of timber and iron supports make this frame of exceptional interest.

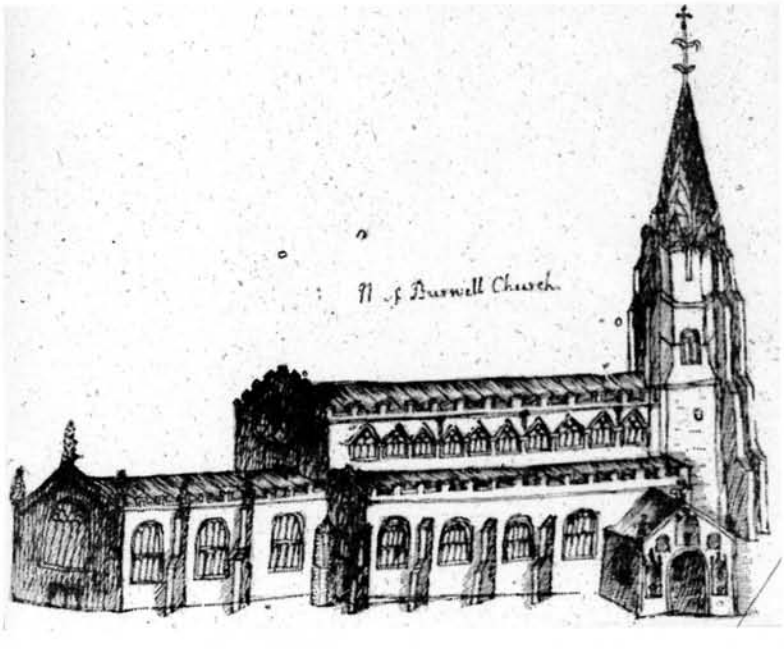


Plate 2. *Burwell Church as drawn by Cole in the mid 1700s.*

Gazetteer of Cambridgeshire bell frames

At the end of each entry three sets of brackets appear always in the same order. The figures in the brackets are as follows:

First bracket: numbers of bells in comprehensive surveys:
First figure: 1552
Second figure: 1740s, Cole.
Third figure: Raven 1882.
Second bracket: Pickford plan code.
Third bracket: Pickford truss codes.

Where information exists to fill only two brackets the empty bracket is retained to keep the order.
Where only one bracket is required its nature, e.g. 'truss' is stated.
** denotes a frame which is of conservation quality.*

Abington Pigotts
Treble, 2 and 3 hung dead on a wooden beam spanning from the sill of the west window to the frame of the 4 which is hung for full circle ringing in a wooden frame with pit trusses of simple A form with iron end rails. This whole installation is by Alfred Bowell of Ipswich and was dedicated[95] in 1927 (date of 2 and 3). Space was left for a fourth bell but this was not realised until 1954. A small sanctus bell is hung between the end of the west pit truss and a small trestle consisting of a vertical post on a shaped wooden sill.
(iij, 1+S, 2)(no plan code)(1G, 6A, 2Bv).

Arrington *
Oak frame originally of four parallel pit trusses from which one internal pit truss has been removed. Pit trusses of KP and X forms both with end posts. Item 17 in the text.
(iij, not given, 1)(3.1)(5Ac, 6Hc).

Ashley
Single bell in a masonry turret at the west end. The church built in 1844. (Truss 9B).

Babraham *
Medieval four pit frame with central well and corner posts and some internal posts. Altered to take a fifth bell before Cole's visit in 1742, possibly in 1615 when three bells were given by Henry Palavicino.[96] See Item 27 and Figs 9a–c in the text.
(iiij+S, 5, 2)(4.2–5.3v)(5H, 6D, 5R).

Balsham *upper* *
Medieval four pit frame of majestic scale altered to take a fifth bell before Cole's visit in 1744 by an extension on the south side.[97] See Item 22 and Fig. 8 in the text. Frame abandoned.
(iiij+c, 5 large bells, 5)(4.3–5.3)(5R, 6A, 6N).

Balsham *lower*
Iron frame of 1988 by the Whitechapel Bell Foundry.
(Plan Code – 6.1)(8.3.A.h)

Barrington *
This is one of very few frames described in Raven's 2nd edition. He found four pits round a central square (probably the pre-1552 frame), into which a fifth bell (the treble) had been set diagonally and at higher level.[98] In 1872 the frame was rebuilt and the ring augmented from 5 to 6 by William Blews & Son of Birmingham. Their work is in the form of typical, simple AA great trusses but a number of old SBA trusses were incorporated into the new work. The great truss forming the west side also appears to be old. The SBA trusses were probably the shorter and shallower trusses inside the old frame. Raven considered the old frame to be of the same date as the construction of the tower because 'in 1872 it was found that all the old bolts were driven in from the outside'.[99] He took Conybeare's date of 13th century, but it is now thought that the upper part of the tower is of 14th century date.[100] False short heads to the old trusses.
(iiij+S, 5, 5)(4.2–6.1)(6A, 5R).

Bartlow *
Important short head frame probably of a piece with the bells which are a set of *c.* 1440 by William Chamberlayne. There appears to have been a general overhaul of the bells *c.* 1800.[101] See Item 1 and Figs 1a–c in the text.
(iij, 3, 3)(3.1)(3Q, 3P, 3C).

Barton
1897. Iron frame on wooden bearers by John Warner & Sons of Spitalfields, London. In 1998 a sixth bell was added on the west side.
(iij+s, 4, 4)(5.1–6.1)(8.3.A.e, 8.3.A.h).

Barway
Two recesses in the west gable, now empty. The church redundant and converted to a house.
(Truss 9D).

Bassingbourn
The very interesting accounts of 1497–1536 are rich in references to the bells and, to a lesser extent, the old frame (replaced). They open with the repair of the tower and:

Sale of parts of the old frame
Item alowed to Thomas Asshwell for carying off the Bell fframe in to the churche yard — iiijd
Item allowed to the seid Thomas ffor a dayes werke about the Reysyng of the belfframe — iiijd.

The modest scale of the payments suggests this relates to a small frame, perhaps for a sacring bell.

Next a new treble bell was transported from London at a cost of £14.7s.5d. The account of its commissioning is lost but the list of townspeople who subscribed towards the cost is preserved. In 1499 the townspeople again clubbed together and collected £5.2s.10d towards the recasting of the third bell. The list of subscribers survives, and the accounts relate its transport to and from London not once but twice as it appears that the first recasting was defective: possibly one of the canons broke off. Additional metal was bought for the second attempt. At the same time the other bells were rehung with some new fitting, and in 1501–2 the great bell was recast in London.

Almost every following page has some reference to bells. There were bequests of money and one of timber for the rebuilding of the frame. There were regular payments for white leather for baldricks, for the adjustment of the ironwork and for the' kepying and gresing of the bells'.[102]

The present iron frame on steel bearers was assembled by John Gipson of Meldreth in 1977 using Whitechapel Bell Foundry components. Previously the Miles Graye ring of 5 was hung in a wooden frame with gallows ends to two of the pits.[103] The tower was substantially rebuilt in 1879 and the bells were re-hung in 1897 by Bullock & Son of Ipswich, probably with little work to the frame.[104]
(iiij+s, 5, 5)(6.1)(8.3.A.h).

Bottisham
1929. Oak frame by John Taylor & Co of Loughborough. The trusses of simple A form, some with jack braces. The Mears & Stainbank (Whitechapel Bell Foundry) estimate for the frame, given in competition with Taylor & Co, describes the old frame as an 'unusually massive structure'.[105]
(iij+s, 5+s, 5)(6.1)(6.A, 6.B).

Bourn
1924. Iron frame on steel bearers by John Taylor & Co of Loughborough.
(iiij+s, 5, 6)(8.3)(8.3.A.h).

Boxworth
Two-bell frame of parallel trusses of simple A form with deep braces with central pit truss removed and new single pit formed with two new trusses in the centre. Dates between Cole's visit in 1745 and Raven's first edition of 1869.
(iij, 3, 2)(no plan code)(6.A).

Brinkley
1985. Iron frame on steel bearers by the Whitechapel Bell Foundry. The old frame was a five bell frame (and probably at least as old as Cole's visit in 1750), the second bell being hung in the south window embrasure. It was 'an unusually high frame'.[106]
(iiij, 5, 6)(6.14)(8.3.A.h).

Burnt Fen (Littleport)
Single bell in a masonry bellcote at the west end. Church built in 1878. (Truss 9.A).

Burrough Green *
Oak frame probably of 1710. Simple A form pit trusses and AA end and great trusses.
(iij+s, 5, 5)(5.1)(6.A, 6F).

Burwell *
Oak frame of 1794 by William Faircliff Jnr for which accounts survive.[107] The frame altered in 1955 by the insertion of three trebles into the central well. See Item 56 and Fig. 13 in the text.
(iiij, 5, 5)(8v)(6.D, 6.E).

Caldecote *
Oak frame, probably C17. Four parallel pit trusses of A form with wide braces. The pit ends are not trussed. Modern steel beams were placed over the old frame in 1990 to carry the bells, which are hung dead. The steels are by the Whitechapel Bell Foundry.
(iij, 3, 3)(3.1)(6.A, 8.1).

Cambridge All Saints
Three bells from the demolished medieval church hung dead for chiming in a single pit. Trusses of king post form with end posts with thin braces reaching as far as the end posts. Sanctus in a separate frame of small A trusses. Tower built in 1864 and large enough for 12. The bells are still on their C17 fittings.
(foure+s , 3, 3)(3v)(5.A).

Cambridge Christ Church
Single bell in northwest brick and stone turret. Church built in 1839. (Truss type 9.B).

Cambridge Holy Sepulchre
Two bells in a stone turret of 1841–43 on the north side of the church. (iij+s, 4+s, 1+s)(9.B).

Cambridge Holy Trinity*
A unique three-tier arrangement. The lower two tiers are medieval, the upper tier was probably made in 1705 when a new ring of five was installed. Difficulty of access means that this frame could not be fully surveyed until after this paper was written. See Addendum.
(four+s, 5+s, 5+s)

Cambridge Our Lady and the English Martyrs
1896. High-sided iron H frames by John Taylor & Co of Loughborough.
(plan 8.3v)(8.3.C.e).

Cambridge St Andrew the Great
1956. Iron A frames by John Taylor & Co of Loughborough.
(thre+s, 5, 8)(8.3)(8.3.A.h).

Cambridge St Andrew the Less
Two bells hung in niches in the west gable.
(ij+s, one in a small turret at the west end, 1)(no plan code)(9.D).

Cambridge St Bene't *
17th century frame with massive A braced trusses with jack braces rebuilt with additional metalwork by John Taylor & Co of Loughborough in 1931. See item 48 and Fig. 13b in the text.
(iij + s, 6, 6)(6.9)(6.D)

Cambridge St Botolph *
Medieval frame possibly chestnut rather than oak. Five parallel pit trusses of X form with end posts. End trusses with two curved braces rising from the sill each side of the central post outward to the top rail. See Item 13 and Fig. 4a in the text.
(iiij+s, 4 , 4)(4.1)(6.H).

Cambridge St Clement
Single bell and sanctus hung with wheels in adjacent frames with simple timber A trusses. Tower built 1821 and frames probably of that date.
(i+s, 2 in a detached belfry, 1+s) (no plan code)(6.A).

Cambridge. St Edward *upper* *
Medieval oak frame originally with four pits around a central well but altered to take six. The four great trusses of asymmetrical form with X braces and end posts. See Item 29 in the text and Fig. 9d.
Frame abandoned. Great trusses recently damaged when sound control inserted.
(iiij+s, 6, 6)(4.2–6v)(6.H).

Cambridge. St Edward *lower*
New frame below the old frame. Iron frame erected by Whites of Appleton from Whitechapel components in 1995. (plan 6.1)(8.3.A.h)

Cambridge St Giles
Church built in 1886. Remains of western tile and timber lean-to oriel bellcote. Bell and the majority of the bellcote removed about 10 years ago. Bell now disused and on the floor of the nave.
(4+s, 2 in a wooden shed, 1)(9).

Cambridge St Luke
Church and brick-lined tower/spire completed in 1885. Single bell in small iron A frames by John Taylor & Co of Loughborough.
(Truss 8.3.B.e).

Cambridge St Mary the Great
The only 12 in the County. Hung in an iron frame of 1952 by John Taylor & Co of Loughborough.
(four+s, 10, 12)(12 no plan code)(8.3.A.h).

Cambridge St Mary the Less
Single bell in a small modern wooden turret on the north west roof of the church.
(iij+s, 1 +s, 1)(9).

Cambridge St Matthew
Three bells in a wooden turret at the west end of the church. Church built in 1866.
(Truss 9).

Cambridge St Michael *
Medieval three pit frame altered in C17 by removing the centres of the end trusses to allow two bells to swing in the central pit. Pit trusses all of SBA form with end posts and corner braces. See Item 8 in the text and Fig. 3a.
Frame abandoned and bells sold away.
(3+s, 4, 4)(3.1)(5.R).

Cambridge St Paul
Single bell on wooden headstock hung between simple beams. Date as bell ie 1841. (Truss 1.D).

Cambridge St Peter *
Exceptionally pleasing medieval high-sided frame. Three parallel pit trusses with X bracing below the sill and curved upper corner bracing. Some posts curve in at the head and have cambered top beams. See Item 8 in the text and Fig. 3a.
(2+s, 1, 1)(truss 6.S.4).

Carlton
Two early bells in an ugly stone western bellcote. Raven found 'pits for three' in the old brick tower which was evidently in poor condition.
(iiij, 3, 2)(truss type 9.A).

Castle Camps
Wooden frame of *c.* 1852, when the tower was rebuilt following its collapse.[108] All trusses of queen post form with vertical tie rods and double head between the posts. Massive arch braced supporting structure.
(iiij+ijs)(5.1)(5.P).

Caxton
Composite iron and wood frame of 1883. All trusses of A form made with raking iron braces and vertical tie bolts.
(iiij, 5, 5)(6.1)(7.A.a).

Chatteris
1911. Iron frame by John Taylor & Co of Loughborough. 1,2,4 and 6 in high-sided 'H' frames with 3 and 5 in A frames above.[109]
(iij, 5, 5)(4.3 with two over)(8.3.A.h, 8.3.C.e).

Cherry Hinton
1952. Iron frame by Gillett and Johnston of Croydon.
(iiij, 5, 5)(6.1) (8.3.A.h).

Chesterton
1934. Iron frame by John Taylor & Co of Loughborough. High-sided 'H' frames.
(iiij, 5, 5)(6.4)(8.3.C.e).

Chettisham
Single bell in a C19 wooden turret with a short spire.
(Cole 1, 1)(Truss 9)

Cheveley *
Wooden frame possibly of early date with added fifth pit. Five parallel pit trusses, four with central and end posts and 'X' bracing in each half of the truss. See Item 18 in the text and Fig. 5.
(iiij, 5, 5)(5.3)(5.Y, 5.C).

Chippenham
1898. Wooden frame by C Day & Son of Eye. Four parallel great trusses each embracing two pits of double-jack-braced A form. End trusses of similar form.
(iiij, 5, 5)(6.4)(6.D).

Christchurch
Cylindrical bellcote at east end of nave. The church built in 1864. (Truss 9).

Coates
Not surveyed.

Coldham
Bellcote demolished. The bells inside the church. Church likely to be made redundant. (truss 9.A demolished).

Comberton *
Oak frame of four pits around a central square. The frame has external and internal corner posts. Great trusses of asymmetrical KP form with single jack-brace to shorter side and two jack-braces to long side. Pit trusses of KP form with jack-braces. See Item 39 in the text and Fig. 12a.
(iij, 4, 4)(4.2)(5.D).

Conington
1911. Modern interpretation of the four pit hollow square frame described for Comberton. Teak frame by G Day & Son of Eye. Two great trusses of asymmetrical double-jack-braced 'A/' form and six pit frames of double-jack-braced A form. The other two outer sides (great trusses) consist of pit frames and metal ties across the pit ends.
(iiij, 4, 4)(4.2)(6.D).

Coton *
The frame is of oak and appears ancient but is of no coherent form. The pit trusses and one great truss are of simple A form with wide braces. The east side consists of three untrussed shaped posts taking the ends of the pit trusses.
(iij, 3, 3)(3.3)(6.A).

Cottenham
Huge oak frame with trusses of irregularly braced KP form with corner and internal posts. See Item 44 in the text.
(ij, 5, 6)(6.7)(5.F, 5.P).

Coveney
Softwood frame with trusses of KP form with end posts, probably of 1847. Sanctus added to the east end of the pit hung on two cross members.
(ij, 2, 1)(no plan code)(5.A).

Croxton
Oak frame of very shallow form with vertical tie rods. The north-south great trusses of AA form with jack braces at the extremities. The east-west great trusses of A\ form with one jack brace. The pit trusses of simple A form. Possibly built in 1804.
(iiij, 6, 6)(6.5)(6.A, 6.B).

Croydon *
Oak frame of four KP pit trusses of stout proportions. False short heads with post recesses into head. Heads halved over top rail of end truss. End trusses with jowled posts and corner braces. See Item 32 in the text and Fig. 2f.
(ij+s, not given, 1)(3.1)(5.A).

Doddington
Oak frame probably of 1736 with exceptionally deep head. End trusses and parallel great truss of A\ form. Two other great trusses of symmetrical jack braced A form with very deep jacks. Pit trusses of A form. The 3rd and a redundant bell are hung on a steel frame made up of angle sections.
(iij+s, 5, 6)(5.1 with 3rd over)(6.B, 8.1).

Dry Drayton *
Oak frame which may have been a four pit frame arranged around a central square. The pit trusses of X form and the great frames predominantly asymmetrical. See Item 42 in the text.
(iij+s, 4, 5)(5.12)(6.H).

Dullingham *
Ancient frame with pit trusses of SBA form and a sixth (empty) pit with trusses of double jack braced A form. See Item 34 in the text and Fig. 3c.
(iiij, 5, 5)(6.12)(5.R, 6.D).

Duxford, St John *
Three pit wooden frame with SBA pit trusses with jowled end posts. Three additional bells accommodated by lengthening the centre pit to the north and adding a further pit at right angles on each side.[110] See Item 9 in the text and Fig. 3b.
(iij+s, 5, 6)(6 unclassified)(5.R).

Duxford, St Peter
1949. Iron frame by Gillett and Johnston of Croydon.
(iij+s, 4+s, 1 (pits for 3))(6.1)(8.3.A.m).

Elm
1914. Iron frame by the Whitechapel Bell Foundry.
(iij+s, 5, 5)(6.1)(8.3.A.e).

Elsworth *
Substantial wooden frame. The pit trusses of curved 'X' form and the great trusses similar but asymmetrical and with an additional brace at the pit end. The end truss with substantial curved braces in A form. See Item 25 in the text and Fig. 4d.
(iiij+s, 4, 4)(4.3)(6.H, 6.J).

Eltisley
Wooden trusses with gallows ends to the central two-bell pit. Great trusses of A form with an extra parallel brace each side. Pit trusses of A form. Both with vertical tie rods.
(iij+s, 4, 4)(4.6)(6.F, 6.A).

Ely Cathedral
Four bells in separate tall trestles. One bell in the southeast turret.
(5+c, 5)(no plan code)(2.A).

Ely Holy Trinity
Not surveyed.
(iiij+s, Cole not given, 1+s)

Ely St Mary
Wooden frame with vertical iron ties. The pit trusses of A form and the great trusses of multiples of the A form. The frame probably of 1882[111] but a pit frame between 4 and 8 with much wider braces may be the remains of an older frame.
(iij+s, 5, 8)(8.3)(6.A).

Ely St Peter
Single bell in a southwest masonry turret. Church built in 1890.
(Truss 9B).

Fen Ditton
Steel frame fabricated from standard rolled sections by John Gipson of Meldreth in 1982. Four great trusses of AA form.
(iiij, 5, 5)(8.1)(8.1.B).

Fen Drayton
Single bell in a two tier three pit frame of oak which may be of *c.* 1828, which Raven gives as the date of the single bell. The lower pit trusses of simple A form with end posts and straight braces, some of which are of deep form, and end frames with simple straight braces to the central post. The upper frame sits on the lower. The upper posts are jowled but not continuous. There are small, neat assembly marks. The frame sits on a C19 floor frame with chamfered joists.
(iii, 3, 1)(no plan code)(6.S.3).

Fordham
Iron six bell frame of 1963 by Whitechapel Bell Foundry. Three bell frame added above in 1988 to augment the ring to eight. This frame of local manufacture from steel box sections.
(ii+s+c, 6+c, 6)(3.1, 6.1)(6.3.A.h, 8.1.B).

Fowlmere *
An exceptionally fine and impressively massive oak frame for four bells hung round a hollow square into which a fifth bell has been inserted. See item 40 in the text and Fig. 12c. Bells hung dead.
(iij, 5, 5)(5.8 from 4.2)(5.D).

Foxton
Dated 1882. Wooden frame with iron ties by George Day and Sons of Eye. Pit trusses of X form and great and end trusses of XXX form.
(iij+s, 6, 5)(5.1)(6.1).

Friday Bridge
Not surveyed.

Fulbourn
1980. Iron frame of 'H' form trusses by the Whitechapel Bell Foundry.
(iij+s, 2+s, 6)(8.3)(8.1.F.e)

Gamlingay *
Massive oak frame constructed for five bells. Probably built in 1653 (the date of the Miles Graye bells) possibly with some earlier material. Sixth bell in a simple steel frame above. The trusses are essentially of SBA form with jack braces. The unusual and visually impressive feature of the frame is the formation of gallows ends, which are used to make the most of limited space. See item 37 in the text and Fig. 11. Altered by George Day & Sons of Eye in 1897.[112]
(iiij, 5, 5)(5.1)(5.R and variations).
In 2000 a new iron frame was installed for a ring augmented to 8 (type 8.3. C.e)

Girton *
Oak frame of majestic scale. Five pit trusses of SBA form, one with jack braces. See item 35 in the text and Fig. 3f. Corner posts jowled top and bottom. End truss with simple curved bracing between posts. Unringable.
(iij, 4, 4)(4.1)(5.R and variation).

Gorefield
Built 1870. Single bell in a stone bellcote at the east end of the nave.
(Truss 9.A).

Grantchester *
An important early frame with many alterations. See Item 2 in the text and Fig. 1d. Three of the pit trusses of KP form with converging jack braces and one of 'X' form. One end truss of KP form and one of unbraced posts, some of which are jowled. Derelict.
(iij+s, 3, 3)(3.1)((3.C, 5.D, 6.H).

Graveley.
Wooden frame with iron tie rods. Built 1910 by John Warner & Son of Cripplegate[113]. Simple A pit trusses. End and great trusses similar but with end and centre posts. pits for five but only four bells.
(iij+ijs+ijh, 4, 4)(5.1)(6.A).

Great Abington *
An ancient frame of oak. Raven suggests that there were pits for five, but this is not possible unless the present arrangement arose from a total post-Raven reconstruction. The pit trusses of SBA form with false short heads. End truss of KP form but with braces from sill to head and not jointed to post. The outer side of the single end pit formed by a short KP truss of similar form fitted into the window reveal. See item 24 in the text.
(iiij+s, 3, 1+s)(4.3)(5.R, 5.L).

Great Chishill *
Oak frame dated 1657 with later alterations. The trusses of Huntingdonshire type with deep braces forming A frames with slighter jack braces. See item 47 in the text.
(plan 5.1)(6.B).

Great Eversden *
Exceptionally tall frame of oak originally of SBA form but with east truss replaced in XIX form. See Item 10 in the text and Fig. 3.e. False short heads and jowled posts. Simple 'X' bracing in end truss. Unringable.
(iij+s, not given in Cole, 3)(3.1)(5.R, 5.Y).

Great Shelford *upper* *
Substantial oak frame probably there in Cole's time but unlike any of the known C17 frames in the area. The tower was rebuilt in 1798. See item 48 in the text. The old frame now abandoned to a new iron frame for eight bells completed in 2001.
(iij+s, 5, 5)(5.1)(5.Y)

Great Shelford *lower*
New iron frame (type 8.3 A.h.)

Great Wilbraham
Iron frame by Whitechapel Bell Foundry of 1958. Five bells hung in a six-pit frame.[114]
(iiij+s, 5, 5)(6.1)(8.3.A.h).

Guilden Morden
Fine wooden frame of 1877 by G & F Day of Eye. Almost identical to the frame of the same date and make at Haddenham. Pit trusses of simple A form, great trusses of 'AAA' form.
(iiij+s, 6,)(8.3)(6.A).

Guyhirn
Single bell in a delightful timber cupola at the west end, *c.* 1637. (Truss 9)

Haddenham
6 bells in a frame for 8. Oak frame with metal ties and angles dated 1877 by G & F Day of Eye. Pit trusses of simple A form, great trusses of 'AAA' form.
(5+2s, 6, 6)(8.3)(6.A)

Hardwick *
An important oak frame with high sided trusses set diagonally to form the middle pit. These have 'X' bracing to the lower part and corner bracing to a cambered tie beam. Small exterior trusses of 'X' form. End truss 'X' braced. See Item 30 in the text and Fig. 10a–c. Unringable.
(iij+s, 3, 3)(3.1)(6.S, 6.H).

Harlton
1856. Wooden frame by C Bullock & Sons of Ixworth. Simple A trusses with iron ties. End trusses of 'A\' form.
(iij, 3, 3)(3.1)(6.A)

Harston *upper* *
Oak frame of the hollow square form. The short pit trusses of KP form with elbowed braces and the great trusses of asymmetrical form with a KP to the pit side and a brace from post to head at the pit end. Some false short heads and much later iron and wood reinforcement. See Item 45 in the text and Fig. 12.
(iij, 4, 4)(4.2)(5.A)

Harston *lower*
1937. Iron frame by John Taylor & Co of Loughborough. (plan 6.1)(8.3.A.h).

Haslingfield *
Massive oak frame of 'Huntingdonshire' type with massively broad braces generally forming A frames with a variety of jack braces some of which are themselves braced. See Item 49 in the text and Fig. 13.
(iij+s, 4, 5)(5.3–6.1)(6.D)

Hatley St Denis
Western stone bellcote of 1874 by Butterfield. Church semi-derelict and bell removed.
(Truss 9.A).

Hatley St George
Two bells in an oak frame for three. Pit trusses of simple A form, one with convex curved braces. The frame probably pre-dates Cole in the mid C18, and may be contemporary with one of the bells, but shows signs of re-assembly. Derelict.
(iii, 2, 2)(3.1)(6.A).

Hauxton *
Oak frame of four similar pit trusses of double, interlaced 'X' form with end trusses of 'X' form (see Item 50 in the text and Fig. 13) This form has no parallel in this survey. The set of three Miles Graye bells of 1666 may indicate the date of construction of this frame. Bell fittings derelict.
(iij, 3, 3)(3.1)(6.R).

Heydon
1956. Iron frame by the Whitechapel Bell Foundry. That is the date of the rebuilding of the tower which was destroyed by enemy action in 1940. The frame has pits for six although there are only five bells and the arrangement is like plan code 8.3 but with two of the four central pits missing to accommodate the clock. (Truss 8.3.A.h).

Hildersham
1880. Wooden frame by John Taylor & Co of Loughborough with vertical and diagonal tie rods as part of the design. Pit trusses of simple A form. End trusses of V/ form. Some older timbers survive in the support grillage.
(iij+s, 3, 3)(3.1)(6.A)

Hinxton
1903. Wooden two-pit frame by Alfred Bowell of Ipswich. Simple A trusses.
(iij+s, 4+c, 2), (Truss 6.A)

Histon
1933. Gillett and Johnston frame for six rebuilt and extended in 1968 by the local ringers using frame sides by John Taylor & Co of Loughborough.
(iij+s, 5, 6)(8.3)(8.3.A.h, 8.3.A.m).

Horningsea
1938. Timber frame with iron ties by John Taylor & Co of Loughborough. All trusses of simple A and A/' form.
(iij+s, 4, 4)(5.1)(6.A).

Horseheath *
Oak frame for four bells probably of 1606 (date of a bell subsequently recast by Richard Keene of Royston in 1700). See Item 33 in the text. Frame of good quality with king post pit trusses with curved braces. Some of the posts taper towards the sill. The end truss of simple A form. Large assembly marks.
(iij+s, 5, 4)(4.3–5.12)(5.A).

Ickleton
1927. Iron frame by Gillett and Johnston of Croydon.[115]
(iij+s, 6+2 on spire, 6)(8.3)(8.3.A.m).

Impington
1925. Iron frame by John Taylor & Co of Loughborough.
(iij+2s, 3, 3)(3.1)(8.3.A.h).

Isleham
1969. Iron frame by John Taylor & Co of Loughborough.
(iiij, not given by Cole, 5)(6.1)(8.3.A.h).

Kennett
Modern oak frame with metal ties. Pit trusses of simple A form and end trusses with jowled king posts. Unringable.
(unreadable, 3, 3)(3.1)(6.A, 5.A).

Kingston *
Oak frame possibly pre-1552. The pit trusses with X braces placed asymmetrically and posts with shaped jowls (see Item 15 in the text and Fig, 4a). The end truss simply braced in the top corners. Similar to Lolworth. Unringable.
(iij, 3, 3)(3.1)(6.H).

Kirtling
A few fragments of the frame for five bells which was destroyed when the bells were dispersed between 1951 and 1973. A local resident suggests that the frame was sold for £5 for firewood.
(iij, 5, 5)

Knapwell
Single bell in a 3 pit oak frame. Relatively flimsy pit trusses of simple A form and deeper end trusses of IV form suggest a late C18 date.
(iij, 3, 1)(3.1)(6.A).

Landbeach
1929. High sided iron frame by John Taylor & Co of Loughborough.[116]
(no record, 4, 4)(4.3)(8.3.C).

Landwade
Probably late C18 oak frame. Pit and end trusses of 'V' form with double jack braces (that is similar to the Burwell frame). Bells chimed by lever. (iij, 3, 2)(3.1)(6.E)

Leverington
1924. Wooden frame by John Taylor & Co of Loughborough. Pit trusses of A form, great trusses of A\ form and end trusses of AA and VV form.
(iij+s, 5, 6)(6.1)(6.A)

Linton
1897. Iron frame on wooden beams by John Warner of Cripplegate. Steel RSJs added c1960 to strengthen the wooden supports.
(iiij+s, "in which hang bells", 5)(6.1)(8.3.A.)

Litlington
1919. Wooden frame with iron ties on a metal supporting grillage by Alfred Bowell of Ipswich[117]. The pit trusses of simple A form and the great trusses of 'AA' form.
(iiij+s, 5, 5)(6.1)(6.A)

Little Abington *
Wooden frame, probably medieval. Unusual plan with a narrow space between the two parallel pits. Pit trusses of elbowed X form. See Item 19 in the text and Fig. 7. End truss with elbowed braced from posts to top rail. The corner posts heavily jowled top and bottom. Intermediate posts jowled at the top. Complicated supporting structure with three levels of beams. Only one bell survives and the frame is now fragile.
(iij+s, 3, 1)(3.3)(6.H, 6.N).

Little Chishill
Single bell dated 1774 in an oak trestle with braced upper corners. Probably all of a piece.
(ij, no Cole,1[118])(no plan code)(6.N)

Little Downham *
An important two-tier oak frame with two bells on each level, probably of 1659 or earlier. The pit trusses with KP lower section and tall curved X braces to upper, taller part. The posts jowled. End trusses with middle rails and two tiers of opposing bracing. See Item 54 in the text and Fig. 10e. Hung dead.
(iij, 4, 4)(no plan code)(6.S.4).

Little Eversden *
Possibly of 1629 or 1666, at which times bells were provided. Hollow square plan with pit trusses of curved X form and great trusses with curved X bracing to the pit sides and a single brace from post to head at the pit ends (see Item 43 in the text). RCHM suggests C17[119] and this is supported by the bell dates, the numbers of bells in 1552 and Cole's visit in the mid C18. Derelict and unringable.
(iij+s, 4, 4)(4.2)(6.H, 6.J)

Little Gransden
Three bells in a four pit frame of oak. Pit trusses of A form with jack braces. Possibly early C18.
(iij+s, 3, 3)(4.3)(6.B).

Littleport
1891. Wooden frame by Warner of Cripplegate.
The pit trusses of simple A form and the great trusses combinations of double A and XAX.
(iij, 4, 4)(8.3)(6.A).

Littleport St Mathew
Built 1878. Single bell cote. (Truss 9.A).

Little Shelford
1961. Iron frame by the Whitechapel Bell Foundry
(iij+s, 4, 5)(6.1)(8.3.A.h).

Little Thetford
A single bell in a double stone bellcote at the west end of the nave.
(ij, 2, 1)(Truss 9.A).

Little Wilbraham *
Oak frame with one internal pit truss of SBA form and two of curved A form (see Item 36 in the text).
(iiij+s, 3, 3)(3.1)(5.R, 6.A).

Lode
Single bell in a bellcote which had two niches which have been knocked together. Church built in 1852. (Truss 9.A).

Lolworth *
Tall oak frame possible of early date with later alterations of more than one period (see Item 16 in the text). Three pit trusses of X form with shaped, jowled end posts. One pit truss of A form with double jack braces. A fifth truss has been removed since Raven, who found pits for four.
(iij, 5, 3- pits for 4)(3.1)(6.H, 6.D)

Longstanton St. Michael
Stone bellcote for two bells at the west end.
(ij, 2, 2)(Truss 9.A).

Longstanton All Saints
1913. Iron H frames by John Taylor & Co of Loughborough.
(iij+s, 3, 3)(8.3)(8.3.C).

Longstowe *
Tall oak frame with pit trusses of KP form with curved braces and jowled end posts. The end trusses with crossed braces probably of later date (see Item 3 in the text and Fig. 2a).
(iij+s, 3, 3)(3.1)(5.A).

Madingley
1927. Two bells hung in a four pit frame by John Taylor & Co of Loughborough.
(iij+s, 3, 3)(4.2)(8.3.A.h).

Manea
Not surveyed.

March St Peter
Built 1881. Single bell hung between braced beams.
(Truss similar to 1.iv).

March St Mary
Built 1873. (Truss 9.A).

March St Wendreda
1929. Timber and iron frame by John Taylor & Co of Loughborough[120]. The pit trusses of A form with jack braces and the great trusses a double version of the same. The pit ends formed of cast iron 'X' frames.
(iiij+s, 5, 6)(6.5)(6.B).

Melbourn
1913. Steel frame dated by Alfred Bowell of Ipswich. The trusses consist of heads and sills of T section joined by 5 pairs of braces of X form. Two pits added by local ringers on the S side using Whitechapel cast iron sides.
(iiij+s, 5, 5)(6.4 to 8.1)(8.1.C, 8.3.A.h).

Meldreth
1937. Wooden frame with iron ties by Alfred Bowell of Ipswich. Modern steel additions to extend to 8 bells (the 2nd above the 4th and the 3rd in a new pit to the north). Simple single and double A frames. (iij+s, 4, 4)(6.1 to 8 unclassified)(6.A, 8.3.A.h).
When Gillett & Johnston visited in 1886 there was a wooden frame with four pits arranged round a hollow square.[121]

Mepal
A single bell in a double stone bellcote at the west end. Probably C13 but much restored.
(not recorded, 1, 1)(Truss 9.A).

Milton *
Four pit oak frame but with two bells in one long pit and one pit vacant with no evidence of a bell having been hung. The pit trusses of X and X/ forms and the great trusses of XX and A/ forms. See Item 51 in the text. The eastern end truss with gallows end with braces to two pits.
(iij+s, 3, 3)(similar to 4.4)(6.H, 6.J, L.1).

Murrow
1857. Single bell in a western stone bellcote. (Truss 9.A).

Newton *
Oak frame probably medieval. Pit trusses of KP form with false short heads. The end trusses simply braced from posts to top rail. See Item 5 in the text and Fig. 2c.
(iij, 3, 3)(3.1)(5.A).

Newton in the Isle
1894. Iron H frames by John Taylor & Co of Loughborough.
(iij+s, 4, 6)(6.1)(8.3.C.e)

Oakington
1977. Iron frame by John Taylor & Co of Loughborough. The foundations of the medieval three pit frame survive above the new frame.
(iij+s, 4, 4)(6.1)(8.3.A.h)

Orwell
1931. Iron six bell frame by John Taylor & Co of Loughborough extended for eight bells in 1998 using similar type frames by the Whitechapel Bell Foundry.
(iij, 5, 5)(8.3)(8.3.A.h).

Over
1931 . Iron frame by the Whitechapel Bell Foundry.
Sanctus bellcote.
(v+s, 5, 6)(8.3)(8.3.A.h and 9.A).

Pampisford
1977. Iron frame by John Taylor & Co of Loughborough
(iij+s, 4, 4)(6.1)(8.3.A.h).

Papworth St Agnes
Oak frame which appears to have been reused at the reconstruction of the tower in 1848. The form suggests the C17 (as the date of the bells recorded by Raven), probably housing the 3 bells noted by Cole in 1745. Pit trusses shallow, of A form and with heavy straight braces. End trusses deep, of similar A form but with jack braces. The southwest corner cut off to accommodate the spiral stair.
(iij, 3, 2)(3.1)(6.A, 6.B).

Papworth Everard
Single bell hung for full circle ringing between A frames with metal vertical ties. Probably of 1873 which is the date of the bell by the Whitechapel Bell Foundry.

On the south side a sanctus supported from the frame and a trestle with a vertical post and downward straight braces to east and west.
(ii, 1, 1)(no plan code)(6.A).

Parson Drove *
A tall three bell frame altered to take five by the addition of new longer heads over the old trusses. Probably pre-1552. The pit trusses of KP form with jowled posts. See Item 4 in the text and Fig. 2b.
(iij+s, 4, 5)(3.1)(5.H, 6.M).

Prickwillow
Single bell in a turret with a short shingled spire at the crossing. Church built in 1868.
(Truss 9.B)

Queen Adelaide
A single bell in a brick bellcote built 1883
(Truss 9.A).

Quy *
Tall and flimsy oak frame probably pre-1670 when the existing ring of five bells by John Darbie was installed. The pit trusses of A form with a central post.
(iij, 5, 5)(4.3 to 5.1)(5.L, 5.N).

Rampton
1938. Teak frame by Gillett and Johnston of Croydon. Simple A, AA, and IA forms with original iron ties.
(iij, 3, 3)(6.5)(6.A).

Reach
1860. Single bell in a western masonry bellcote.
(Truss 9.A).

Sawston *
A very fine timber and cast iron frame of 1891 by John Taylor & Co of Loughborough. The High Victorian summit of the bell hangers art. See Item 56 in the text.
(iiij, 5, 6)(8.3)(8.3.C, 8.3.A)

Shepreth *
The 1552 survey says viij bells – the only 8 in the whole inventory – but there is no evidence of provision in the tower. Visible are the foundations of a medieval three pit frame. One SBA truss survives. See Item 12 in the text. The end trusses appear to contain ancient timber.
(viij, 5, 3)(no plan code – previously 3.1)(5.R, 6.H).

Shudy Camps *
Probably pre-1552 frame with pit trusses of KP form. See Item 21 in the text and Fig. 6. Greatly altered.
(iiij+s, 5, 5)(4.3)(5.C).

Snailwell *
Important early form of long head frame. Pit trusses of KP form with inward sloping jack braces. The end rails, which are halved over the truss heads are shaped on plan (see Item 6 in the text and Fig. 2d). The sills unusually flimsy (supported on modern timbers). The bells hung dead.
(iij, not given by Cole, 3)(3.1)(5.D)

Soham
Oak frame of 1788 with metal ties. Augmented from 8 to 10 bells in 1808. Pit trusses of simple A form and great trusses of AA and /A\ form.
(iiij+s, not given by Cole, 10)(10.6)(6.A).

Southea
1872. Single bell in a brick bellcote at the east end of the nave.
(Truss 9.A)

Stapleford
1911. Iron frames of 'H' form by John Taylor & Co of Loughborough.
(iij, 5, 5)(6.4)(8.3.C).

Steeple Morden
A single bell in a three pit frame which appears to pre-date the rebuilding of the 'steeple' in 1866 (see also Papworth St Agnes). The pit trusses of curved A form with jack braces except one truss which is unbraced. The end trusses of similar form with straight braces.
(iiij+s, 3, 1)(3.1)(6.B).

Stetchworth
1827. Wooden frame signed and dated by W Hart of Brinkley. Typical flimsy construction with vertical tie rods. The pit trusses simple A form and the great trusses of double and one and a half A form.
(iiij, 5, 5)(5.12)(6.A).

Stretham
1952. Low sided iron frame by John Taylor & Co of Loughborough.
(iij+s, 4, 4)(6.1)(8.3.A.h).

Stuntney
1876. 3 bells hung dead in a pine box frame with X braced sides. Tower rebuilt.
(ij, 2, 1)(3.1)(5.Y).

Sutton *
A massive frame for four arranged round a central well augmented by forming a long double pit on the east side and a diagonal pit in the well. Both great trusses and pit trusses symmetrical and of SBA form. See Item 41 in the text and Fig. 12a. This frame has been dated by dendrochronology to 1620.
(iiij+s, 6, 6)4.2 – 6 unclassified plan)(5.R).

Swaffham Bulbeck *upper frame*
1820[122] or later. Low oak frame with pit trusses of simple A form, great trusses of AA form and end trusses of /A form. North-south frames deep and east-west frames shallow. Following fire damage a new floor was provided in 1937 with no provision for ringing.
(iij+s, 4, 6)(6.5)(6.A).

Swaffham Bulbeck *lower frame*
2000. Eight bell iron frame by Hayward Mills Associates.
(plan 8.1)(8.3.A.h).

Swaffham Prior: St Mary
All evidence of ringing removed.
Raven has the six bells by John Briant in this church and not in the sister church; see next entry. Given that the tower of St. Mary was derelict throughout the latter part of the C19 this must be a mistake[123]
(iij+s, 5, 0)

Swaffham Prior: St Cyriac and St Julitta
1791 or later. Low oak frame with pit trusses of simple A form and great trusses of \A form and VA form. Later metal reinforcement.
(iij+s, 3, 6)(6.3 handed)(6.A).

Swavesey
1932. Iron frame by Gillett and Johnston of Croydon. Some fragmentary remains of an old frame below the existing frame.
(iiij, 5, 6)(6.1)(8.3.A.m).

Tadlow
1893. Wooden frame with iron ties by the Whitechapel Bell Foundry. Pit trusses and end truss of A form and great trusses of /A form.
(iij+s, 3, 1)(3.3)(6.A)

Teversham
Modern steel frame fabricated from standard rolled sections. The old frame is noted in the Royal Commission inventory for *NE Cambridgeshire* but has disappeared without trace or record. It is a weakness of the faculty jurisdiction that removal could be allowed without any formal arrangement for recording. Vandalism.
(iij, 2, 1)(1)(8.1.b).

Thorney Abbey
Single bell in the stone northwest turret. (Truss 9.B).

Thriplow *upper* *
A much-altered, medieval, wooden frame. The one pit truss of curved SBA form with jack braces. See Item 23 in the text. One further similar but altered.
(iiij, 4, 5)(4.3–5.1)(5.R)

Thriplow *lower*
1996. Iron frame erected by Whites of Appleton using trusses by the Whitechapel Bell Foundry.
(plan 6.1)(8.3.A.h).

Toft *
Wooden frame with vertical tie rods of 1894. Pit trusses simple A form and the great trusses of double A form. Extended 1999 with metal trusses to take two more bells.
(iij, 3, 3)(3.1–5.1)(6.A, 8.3.A.h).

Trumpington
Timber frame of six pits installed by Alfred Bowell of Ipswich in 1900. Extended by two pits on the south side by John Taylor & Co of Loughborough in 1957. Simple A and AA trusses.
(iij+s, 5, 5)(8.3)(6.A).

Tydd St Giles
Timber frame of 1887 by the Whitechapel Bell Foundry. Simple A frames.
(iij+s, 5,5)(6.1)(6.A).

Waterbeach *upper* *
Probably C18 oak frame. North-south great trusses of A form with double jack braces. North-south pit truss of / form with double jack braces. All east-west pit and end trusses of simple A form. Unringable.
(iij+s, 4, 5)(3.3)(6.D).

Waterbeach *lower* *
Medieval frame with simple elbowed X bracing to the pit trusses. See item 14 in the text and Fig. 4b.
(no plan code)(6.H, 6.N)

Wentworth
Single bell on simple wooded trestles, possibly of 1845. Chimed by lever.
(ij, 1, 1)(no plan code)(3.A)

Westley Waterless
Single bell hung within the wooden framing of a western fleche of 1885.
(iij+s, 3, no bell)(9 unclassified).

Weston Colville
Wooden frame with iron ties. 1825 by W Hart of Brinkley and G Bullock and Son of Ixworth. Low frames of equal depth. Pit trusses of A form. Great and end trusses of /A, AA and XX form.
(iiij, 5, 5)(5.12)(6.A).

West Wickham *
A much altered medieval oak frame with pit trusses of SBA form (see Item 11 in the text) with two additional pits formed at the east side probably in the C18 with simple A frames with latter additional bracing. Unringable.
(iij +s, 5, 5)(3.1 to 5.1)(5.R)

West Wratting
1958. Iron frame by John Taylor & Co of Loughborough.
(iij, 5, 5)(6.1)(8.3.A.h).

Whaddon *
Probably the three pit frame which existed in 1552 altered in 1671 to take two additional bells. Three of the pit trusses are of KP form with distinctly elbowed braces and jack braces. See Item 7 in the text and Fig. 2e.
(iij+s, 5, 5)(3.1 to 5.12)(5.D).

Whittlesey, St Andrew
1930. Frame on two levels by Gillett and Johnston of Croydon. The upper frame of wood on RSJs. Pit trusses of A form with iron ties, end trusses of \V and V/ forms. The lower frame with pit trusses of A form with iron ties horizontally and vertically and great and end trusses of AA and V/ forms and small end frames of iron of X form.
(iiij+s, 4, 6)(3.1 and 5.1)(6.A).

Whittlesey St Mary
1902. Iron frame by the Whitechapel Bell Foundry. The trusses on timber bearers with I beams under.
(iij+s, 5, 8)(8.3)(8.3.A.e).

Whittlesford
1905. Wooden frame with metal ties by the Whitechapel Bell Foundry. The pit trusses of simple A form, the great trusses of double A form.
(iij+s, 5, 5)(6.1)(6.A).

Wicken *
A muddle of ancient timbers and G & F Day's work of 1910 (see Item 26 in the text). The frame is exceptionally tall. In the old work the pit and great trusses are principally of 'X' form with straight and curved braces and end posts. In some trusses additional asymmetrically placed bracing runs from head to sill or head to post. The end truss has curved bracing with notch lap joints. The modern trusses are of 'X' form placed on the old sills
(iiij, 5, 5)(5.12)(6.H).

Wilburton
1966. High sided metal 'H' trusses forming a cramped cage. John Taylor & Co of Loughborough installed the frame.
(iij+s, 5+s, 5)(6.5)(8.3.C.e).

Willingham
1924. Iron 'H' frames by John Taylor & Co of Loughborough with the 2nd in low-side iron trusses placed above.
(iiij+s, 5, 5)(5.1)(8.3.C.e, 8.3.A.h).

Wimblington
Single bell hung from a wooden headstock suspended below a cross beam which forms part of the tower structure built in 1874. Bell by the Whitechapel Bell Foundry.
(1.C.iii)

Wimpole
Single bell in a pretty cupola at the west end. Probably part of Flitcroft's work of 1743.
(iij+ijs, not given by Cole, 1)(Truss 9.C).

Wisbech
1989. Iron frame by John Taylor & Co of Loughborough. Some fragments of the old frame are in the possession of Wisbech Museum. No measured drawing was made when the old frame was destroyed.
(iiij+s, not given by Cole, 10)(10.1)(8.3.A.h).

Wisbech St Mary
1955. Iron 'H' frames by John Taylor & Co of Loughborough.
(iij, 3, 5)(6.6)(8.3.C).

Witcham
The tower rebuilt 1691. The frame for four has trusses all of curved X form. End posts with pronounced shaped jowl. Possibly a C17 installation of four bells and frame which was reincorporated into the tower with our its bells. Could be a case of selling the bells to mend the steeple.
(ij, 2, 1)(4.4)(6.H).

Witchford
Oak frame with pit trusses of simple A form with lighter V braces halved over, and end posts. The end truss with light section X braces tenoned into sill and posts. Frame is said to have been built in 1889 by George Peck of Ely but probably influenced in form by the frame of 1671 (being the date of the three bells).[124]
(ij, 3, 3)(3.1)(6.A)

Woodditton
1825. Wooden frame dated by William Hart of Brinkley. The pit trusses simple A form, the great trusses A\ and AA, the end truss /X\.
(iiij, 4, 5)(5.12 handed)(6.A).

Endnotes

1 Muskett, J 1895–1904 'Inventories of Church Goods, temp. Edward VI'. *The East Anglian* vi – x.
2 The manuscripts of William Cole are in the British Library but may be read on microfilm in the County Record Office.
3 Blomefield, F 1751 *Collectanea Cantabrigiensia*. Norwich.
4 Raven, J 1869 The Church Bells of Cambridgeshire. Lowestoft.
Raven, J 1881 *The Church Bells of Cambridgeshire*. Cambridge Antiquarian Society.
Raven, J 1882 *The Church Bells of Cambridgeshire*. (2nd Edition Supplement and Index) Cambridge Antiquarian Society.
5 Deedes, C & H B Walters 1909 *The Church Bells of Essex*. Privately printed.
Tilley, H & H B Walters 1910 *The Church Bells of Warwickshire*. Birmingham: Cornish.
Walters, H B 1912 *The Church Bells of England*. London: Henry Frowde.
6 Clouston, R 1997 'Cambridgeshire Bells'. In C Hicks (ed), *Cambridgeshire Churches*. Stamford: Paul Watkins.
7 The Victoria County History holds the manuscript of H B Walters' notes on the churches he visited on its behalf.
8 The Society for the Protection of Ancient Buildings 1945 *Bells and Bell Hanging in Ancient Towers*. London: The Society.
Important is the new publication: Drew-Edwards, A & D Lodge 1998 *Timber Bell Frames*. London: Society for the Protection of Ancient Buildings (Technical Pamphlet No 14).
9 Bliss, M & F Sharpe 1986 *Church Bells of Gloucestershire*. Gloucester: Alan Sutton.
Dodds, G 1992 *The Church Bells of Hertfordshire*. Welwyn: Hertfordshire Association of Church bell Ringers.
10 See for example an attack on English Heritage in *The Daily Telegraph*, (March 6th 1999) p11.
11 Council for the Care of Churches 1993 *The Conservation and Repair of Bells and Bellframes – Code of Practice*. London: Church House Publishing.
12 Elphick, G 1945 'Sussex Bell Frames'. *Sussex Archaeological Collections*, 84: 33–59
Elphick G 1970 *Sussex Bells and Belfries*. Chichester.
13 For example: Brooke, C 1983 'A Survey of Nottinghamshire Bell Frames: an interim report'. *Transactions of the Thoroton Society of Nottinghamshire*, LXXXVII: 46–53.
14 I am grateful to Elphin Watkin for sight of his preliminary summary tables
15 Pickford, C 1992 'Historic Bellframes: a rescue recording project'. *Ringing World*, 9th October: 977–978
Dalton, C 1989 'The Vanishing Bell Frame'. SPAB News, 10, No 4 : 13–15
16 Pickford, C 1993 *Bellframes*. Bedford.
17 Brookes, C (ed) 1995 *The Archaeology of Bellframes*. Nottinghamshire County Council.
18 Royal Commission on Historical Monuments England 1972 *North East Cambridgeshire*. London: HMSO: 136.
19 There are cases where not all of the pits were filled with bells, but these are few in number.
20 Caution is required about putting too much reliance on bell dates because bells are portable and may therefore reflect the date of a frame in another church. In addition, bells were sometimes recast at quite short intervals
21 Based on the inventories referred to in note 1 above
22 The four reliable reports are Ely Cathedral (10), Ely St Mary (5), Haddenham (5), Over (5). The remains of the frame at Shepreth appear to be ancient and suggest a simple three-pit frame not the eight given in the survey (i.e. "iij" not "viij").
23 There are twenty examples of frames for four bells or fewer being built in later centuries but they are all easily distinguishable by their form, and in some cases documentary history, from medieval examples.
24 More properly called a *sacring bell*.
25 BM Add MS 5810, f 143.
26 Cambridge St Benet, Croxton, Fordham, Foxton, Guilden Morden, Ickleton, Sutton.
27 Soham was made into an 8 at the end of the century.
28 Whittlesey St Mary and Cambridge St Andrew the Great.
29 Modern uses of this form are found at Chatteris, and Landbeach.
30 Normally called hollow square or swastika frames. The former term is used in this paper.
31 Modern uses of this form are found at Conington and Madingley.
32 Cattermole, P 1990 *Church Bells and Bell-Ringing A Norfolk Profile*. Woodbridge: 114–123.
Attleborough *c.* 1523; Bedingham *c.* 1513; Bressingham *c.* 1431; Cawston *c.* 142; Shimpling *c.* 1466; Snettisham pre 1468; Swainsthorpe *c.* 1509; Topcroft *c.* 1620; Wacton *c.* 1400. The Wacton frame is interesting because it consists solely of pit trusses and the pit ends are left open.
33 Watkin, E 1994 Sutton in the Isle – Record of Bellframe. Unpublished.
Tyers, I 1995 *Tree-ring Analysis of the bellframe at St Andrew's, Sutton in the Isle, Cambs*. London: English Heritage Ancient Monuments Laboratory Report 15/95.
There are two majestic examples of this form in the Ely Diocese, but outside Cambridgeshire, at West Walton and Tilney All Saints, which have pit trusses with jack braces and bells which suggest a similar date of *c.* 1620.
34 Pickford, C 1993 *Bellframes*. Bedford: 5–54.
35 Jennings, T 1991 *The Development of British Bell Fittings*. Loughborough: 68.

36 Eisel, J and C Pickford, 'Understanding the Importance of Frames'. In Brookes, C (ed) 1995 The Archaeology of Bellframes. Nottinghamshire County Council: 5. This gives the 13th century example of Cold Waltham, Sussex
37 Cattermole, P 1990 *Church Bells and Bell-Ringing A Norfolk Profile*. Woodbridge: 101.
38 CRO P11/5/2, f18v, f19r, f20r: In the important Bassingbourn churchwardens' accounts of 1500 bell hanging is done by a carpenter.
Eisel, J 1997 'The Bells and Bellframe'. In Shoesmith, R (ed), *A Definitive History of Dore Abbey*. Almeley: 195–198. A late medieval example of 1632 is seen at Abbey Dore, where the frame was made by that Herefordshire timber genius John Abel who is better known for his buildings and church furnishings.
39 Eisel, J and C Pickford, 'Understanding the Importance of Frames'. In Brookes, C (ed) 1995 *The Archaeology of Bellframes*. Nottinghamshire County Council: 5–7.
40 There is a frame of this type at Wentworth, but it appears to have been constructed in 1845 (date of the bell it supports).
41 Brooke, C 1983 'A Survey of Nottinghamshire Bell Frames: an interim report'. *Trans Thoroton Society of Nottinghamshire*, LXXXVII: 46–53.
42 Pickford, C 1993 *Bellframes*. Bedford: 2. Here is illustrated an example at West Newton, Norfolk.
43 CRO P11/8/1, P 75 Bassingbourn Accounts – memorandum of 1697: 'In the month of July 1697 the square pieces of oake whereon the treble and second bells lie upon and also the frames of the third, fourth and tenor bells are morticed into was laid in ... John Buckmaster being the workman.'
44 In the Essex study, for example, there are seven examples of a pre-1600 date (see note 14), while Paul Cattermole describes an example of X bracing as unusual (*op cit* note 32: 134).
45 For example North Luffenham, Norfolk (information supplied by Dr John Eisel).
46 There are some good examples to the west in Huntingdonshire which this author hopes to publish in the near future. At Fen Drayton is a modern three-bell frame with one pit above the other two.
47 Modern examples of two-tier metal frames are found at Chatteris and Fordham.
48 The Essex survey (see note 14) found no example of the queen post truss. There are none in the greater part of Huntingdonshire which the author has surveyed, and Cattermole (*op cit* note 35) does not mention the type in his Norfolk survey.
49 Bartlow is one of only two round towers in the County, the other being at Snailwell. There were other examples at Burwell and Westley Waterless which have been demolished since Cole's day.
50 Raven, J 1881 *The Church Bells of Cambridgeshire*. Cambridge Antiquarian Society: 121.
51 Council for the Care of Churches (undated) *Schedule of Bells for Preservation in the Ely Diocese*.
Clouston, R 1997 'Cambridgeshire Bells'. In C Hicks (ed), *Cambridgeshire Churches*. Stamford: Paul Watkins: 365.
52 Pickford, C 1993 *Bellframes*. Bedford: 1.
53 CRO P9/5/1, P9/5/2 and P9/5/3 are Bartlow churchwardens' accounts from 1749–1921. The alteration of the frame cannot be certainly identified but may be in 1846 when the purchase of new ropes for £1.10s.0d coincides with a large bill of £34.8s.2d for D P Day, the carpenter. After this work the ropes appear to be renewed more regularly which also suggests a ringing revival. From 1870 an annual wage was paid to a ringer.
54 There are discontinuous timbers with a section of a quarter of the circle of the log, but these are possibly later repairs.
55 Council for the Care of Churches (undated) *Schedule of Bells for Preservation in the Ely Diocese*. Clouston, R 1997 'Cambridgeshire Bells'. In C Hicks (ed), Cambridgeshire Churches. Stamford: Paul Watkins: 36.
56 The whole installation was in poor condition as early as 1830. CRO P113/6/6 includes a bill for repairs to the frame amounting to just over £3. On the back of the bill the carpenter points to greater faults in that the frame tops were wedged against the walls and might therefore cause damage.
57 VCH Cambs, IV, p 199.
58 Clouston, R 1997 'Cambridgeshire Bells'. In C Hicks (ed); *Cambridgeshire Churches*. Stamford: Paul Watkins: 369.
Raven, J 1881 *The Church Bells of Cambridgeshire*. Cambridge Antiquarian Society: 119.
59 Council for the Care of Churches (undated) *Schedule of Bells for Preservation in the Ely Diocese*.
Clouston, R 1997 'Cambridgeshire Bells'. In C Hicks (ed), *Cambridgeshire Churches*. Stamford: Paul Watkins: 366.
60 Unpublished survey notes of the Royal Commission on Historical Monuments, England.
61 His tomb chest is in the chancel of the church.
62 Council for the Care of Churches, *Schedule of Bells for Preservation in the Ely Diocese*, (undated)
R Clouston, 'Cambridgeshire Bells', *Cambridgeshire Churches*, ed C Hicks (Stamford 1997), p 366
63 Dr John Eisel advises that the transverse pit on the east side is of original build with evidence of former jointing appearing at the south end of the frame head. It was later adapted for two bells, possibly in 1700 when a new treble was cast.
64 There is evidence in the sill of the truss that it has been re-assembled. There is a central mortice which may suggest that the truss on this sill was originally of king post form
65 Council for the Care of Churches (undated) *Schedule of Bells for Preservation in the Ely Diocese*.
Clouston, R 1997 'Cambridgeshire Bells'. In C Hicks (ed), Cambridgeshire Churches. Stamford: Paul Watkins: 364.
66 In Watkins's Essex survey (see note 14) there are examples of the truss with curved X braces, which Pickford (*op cit* note 16) designates "6H", in every century from the 15th to the 18th.
Dr John Eisel advises that cross braces are not common and unlikely to predate the 17th century.
67 VCH Cambs, V, p146.
68 Trusses of similar form are found in a hollow square truss at Topcroft in Norfolk which is thought to date to 1630 (*op cit* note 35: 122).
69 Dr John Eisel suggests that this frame is *c.* 1610–40 because it has shaped end posts.
70 Council for the Care of Churches (undated) *Schedule of Bells for Preservation in the Ely Diocese*.
Clouston, R 1997 'Cambridgeshire Bells'. In C Hicks (ed), *Cambridgeshire Churches*. Stamford: Paul Watkins: 368.
71 Or in 1611 when there was a bequest for the amendment of the peal.
Raven, J 1881 *The Church Bells of Cambridgeshire*. Cambridge Antiquarian Society: 119

72 BL Add MS 5802, f 36.
73 Raven, J 1881 *The Church Bells of Cambridgeshire.* Cambridge Antiquarian Society: 117
74 Clouston, R 1994 Unpublished MS.
75 Raven, J 1881 *The Church Bells of Cambridgeshire.* Cambridge Antiquarian Society: 120. This is the only frame illustrated by Raven, and then he only gives a simplified plan.
76 From the Bury St Edmunds foundry.
77 By Stefannus Tonni.
78 Royal Commission on Historical Monuments England 1968 *West Cambridgeshire.* London: HMSO: 127.
79 Stefannus Tonni, founder.
80 Ricardus Bowler.
81 But see Papworth St Agnes and Steeple Morden where earlier frames are re-used
82 Dr John Eisel considers that the frame is likely to predate the 17th century and may be an example where the pits were not fully used until after the 1552 survey.
83 Author's notes.
84 Tyers,I 1995 Tree-ring Analysis of the Bellframe at St Andrew's, Sutton in the Isle, Cambs. London: English Heritage Ancient Monuments Laboratory Report 15/95.
85 For example at Buckden, Brampton, Great Gransden, Ellingston and Keyston.
86 BL Add MS 5803, f 60.
87 CUL MS 3390.
88 Author's notes.
89 Author's notes.
90 See note 14.
91 Royal Commission on Historical Monuments England 1968 *West Cambridgeshire.* London: HMSO: 199.
92 Raven, J 1881 *The Church Bells of Cambridgeshire.* Cambridge Antiquarian Society: 162
93 There were 3 in 1552 and four when Cole visited in 1748. BL Add MS 5821, f 11.
94 CRO P18/25/59. There is much of interest in the Burwell accounts including a letter from the founder John Briant of Hertford touting for business (P18/25/58).
95 CRO P3/28/9 contains a newspaper cutting describing the event.
96 There are two bells surviving from the ring of 5 noted by Cole.
Gomme, G L 1892 *English Topography, Part II. Cambridgeshire – Cumberland*, London: 22. This is an article of 1815 which establishes that the survivors are two of three bells given by Sir Henry Pavalicini which, in 1815, were accompanied by one bell with Ora Pro Nobis... and another with THOUGH OF THYSELF I ... The bells were at that time so crusted over with rust, and covered with the dung of pigeons .... as to be unintelligible. Only one bell out of the five is used. There is a bill for work on the bells in 1736, but this amounts to only 11/6d and cannot be the major remodeling to form five pits. CRO P6/5/7.
97 Blomefield, F 1751 *Collectanea Cantabrigiensia.* Norwich: 198.
'The Church is a large fair building, with a lofty square tower, and 5 good Bells, which were put into order at Mr Sutton's Death, who left 20l for that Purpose.'
Raven, J 1881 *The Church Bells of Cambridgeshire.* Cambridge Antiquarian Society: 119.
The peal as improved in 1609 seems to have called for further improvement. Sir Thomas Sutton left by will in 1611 'To the Parson and Churchwardens of Balsham, for the time being, to buy a bell withal, to be hanged up in the Steeple, to amend the ring there, twenty pounds.' If the bequest was used for the stated purpose of purchasing a bell, it could only have been by the purchase of a second hand bell – that dated 1540 – or a new one which was recast in 1774.
98 Raven, J 1869 *The Church Bells of Cambridgeshire.* Cambridge Antiquarian Society.
'At this time these bells are sadly out of order. The treble and tenor are on their sides under the frame.'
Raven, J 1881 *The Church Bells of Cambridgeshire.* Cambridge Antiquarian Society: 120–121.
The frame had become 'utterly rotten'.
Scott, M 1984 *Barrington's Bells.* Barrington.
This is an unusually detailed history of the bells with some excellent measured drawings and a copy of Blews & Sons' bill. (That bill does not include work on the frame which was probably done by a local man. The bill for the frame is not preserved.) Scott also describes the findings of the architect, R R Rowe in 1872 who reported that the 17th century bells which were recast later were too big for the old frame which had been cut and mutilated to accommodate them. This had led to damage to the tower. Much of this is based on material in CRO P8/6/2.
There are extracts from accounts from 1856–1929 (CRO P8/5/2) which show that in 1902 Day & Son of Eye, Suffolk re-hung the bells. The bill for £35 is modest and suggests that no major amendments were made to the frame at that time. There are no additional accounts in the CRO.
99 Assertions of assembly in advance of the tower masonry are usually apocryphal.
100 N Pevsner, 1954 *The Buildings of England: Cambridgeshire* p. 297.
101 CRO P9/5/1, P9/5/2 and P9/5/3 are accounts from 1749–1921. The alteration of the frame cannot be certainly identified but may be in 1846 when the purchase of new ropes for £1.10s.0d coincides with a large bill of £34.8s.2d for D P Day, the carpenter. After this work the ropes appear to be renewed more regularly which also suggests a ringing revival. From 1870 an annual wage was paid to a ringer.
102 CRO P11/5/2 the above notes were compiled from a transcription in A B Brannen, *The Bassingbourn St. George Play – A Contextual Study*, (Unpublished dissertation copy *penes* The Cambridgeshire Collection, 1994).
103 The RCHME recorder visited the church in 1950 and found the bells, 'hung in modern bellframe incorporating some old material' (see RCHME record card).
Also, a report by Brian Threlfall of 1974, *penes Ely Diocesan Office*, describes a 'ramshackle' frame of plan type 5.1 with gallows ends to the two tail-to-tail pits. The wooden frame was not recorded when it was destroyed which is a pity because that part of it which was old could possibly have been dated from surviving accounts. The 1697 entry in the Bassingbourn Vestry Book,
'Memorandum — In the month of July 1697 The square pieces of oake whereon the Treble and Second bells lie upon and also the frames of the Third Fourth and Tenor Bells are morticed into was laid in by Joseph Chichelley and Nicholas Gray: Being Churchwardens for the Town of Bassingbourne for the said year John Buckmaster being the workman.' CRO P11/8/1 p. 75.
104 Pevsner, N 1954 *The Buildings of England: Cambridgeshire* Harmondsworth: 301.
Ely Diocesan Remembrancer, 1898: 13.

105 Rogers, H 1996 *A History of Holy Trinity Church Bottisham*, Bottisham: 7–8.
CRO P13/5/1–58, CRO P13/13/5/59, CRO P13/5/63, CRO P13/5/65.
The churchwarden's accounts for Bottisham are particularly rich in references to the bells, the old frame and to ropes, which were consumed at an exceptional rate. Benjamin Hart, presumably related to William Hart of Brinkley (see Stetchworth, Weston Colville and Woodditton) was paid £61 in 1830 for work to the frame and for recasting a bell. This was the William Dobson bell dated 1829 which was recast in 1976. CROP13/5/59. CRO P13/6/36 contains the papers relating to the new frame with estimates by Taylors, Whitechapel and George Day & Son of Eye. The last was the lowest (£270) but a letter from the Architect, William Weir, records the fact that the incumbent felt it 'is not desired to employ them'. Was the handwritten letter of Herbert Day with its colloquial tone frowned upon by the Reverend Uthwatt? The Taylor estimate was for £315 and Whitechapel's was £360.

106 Report by Brian Threlfall of 1970 *penes Ely Diocesan Office.*

107 CRO P18/25/58 and 59. The estimates and accounts for the building of the bell frame and its fittings in 1793–94 and the account of the smith survive and are of special interest.

To 128 Feet of Oak Scantling 5' By 12' inches cut squair and Good at 1..8 P Foot Running Meashur for the Top Cells	*10.13.4*
To 128 Feet of Oake Scantling 7 Inches By 8' for Bottom Cells at 1..6 P Foot Cut Squair	*9.17.4*
To 145 of Oak Scantling 4' By 15' at 1..9 P Foot Cut Squair for Brasses (braces)	*12.2.6*
To 180 Feet of Oak Scantling 6' By 4' for small Brasses [braces] at 8 1/2 P Foot Cut Squair	*6.7.6*
To 5 Squair and Half of Framing at £1..5..0 per Squair	*7.17.6*
To 310 Oak Pins 12 inches Long Each Inch 1P pin	*1.5.10*
To 4 peases to Guide the Roops 10 Foot Long each	*0.10.0*
To the Use of the Roops and pulleys	*0.10.0*
NB To taking Down the 5 Old Bells and Frames and Fixing Up the New Frames for the New Bells in A Workmanlike Manner fir for hanging the New Bells = The Old Bell Frames and all Other the Materials to the same belonging to Be taking By me Wm Faircliff	*49.4.0*

108 CRO P34/5/1

1851: July 19	
Five men, horses and waggons getting the bells out of rubbish and carting lead	*0.10.6*
Beer for the men	*0.1.6*
Men and horses getting the bells to the Castle	*0.8.6*
1852: July 1	
Paid A Wright balance on Bell Frame	*2.0.0*
To Casting Bell (Taylor & Son/Loughborough)	
Carriage of Do one way	*20.0.0*
Carriage of bell from Loughborough	*1.0.2*

109 CRO P38/5/7. The churchwardens' accounts covering Eayre's work are lost but there is a beautifully written bill of 1786 for work on the bells and frame by Richard Smith. The bill also includes all manner of work to the church, the churchyard, the roads and even tunneling. It shows that the maintenance of bells and frame were not considered to be specialist work but were within the compass of the better class of country craftsman, who could still be called jack-of-all-trades.

110 CROP62/6/1 has various papers about the bells including some bills from St John which appear to have been assembled by T Teversham whose proof copy of an article about the bells is in the same envelope. The bill for three bells receipted by Edward Arnold is there along with the bill of John Pearson, the smith, who hung the bells and altered the frame. There is also a bill for carriage from Cambridge to St Neots and back. The bells, with allowance for three old bells cost a little over £32.

111 CRO P68/6/4

112 CRO P76/8/1. Day's work cost £168.

113 CRO P80/3/5 has the report of the architect, Inskip-Ladds who found,
'I have also examined the bell frame, and find that three large main timbers and one smaller one are very rotten and are a danger to the bells. The frame (with this exception) appears to be generally sound, but it requires a little tightening at the joints, and I strongly advise that this should be done by an experienced firm of bell-hangers. Such firms will charge little (if any) more than an ordinary builder, and they will be far cheaper in the long run, as their constant experience with bells enables them to deal with the matter in the most effective manner.'
When Warners of Cripplegate were asked for an estimate they must have advised that the frame should be replaced, and a further appeal was made for funds. The Warners estimate of £105.12s.6d for a completely new frame survives

114 CRO P174/6/6: the faculty which gives the cost of the work as £1,100.

115 *Ringing World* 1977, p. 769.

116 CRO P104/6/9. The faculty for the 1929 work records the contribution to the bell work made by Corpus Christi College in payment for the Royal Arms which went to the College.
CRO P104/6/10 has a photograph of ten ringers at the 1929 dedication (nine men and one woman).
CRO P104/8/3 is Taylor's receipt for £258.6s.0d.

117 CRO P108/8/2 is the unsuccessful estimate of John Taylor & Co of Loughborough in the sum of £274. The parish could choose between oak or iron for the frame both for the same price of £58.

118 Deedes, C and Walters, H B 1909 *The Church Bells of Essex*, privately printed, 211.

119 Royal Commission on Historical Monuments England, 1968 *West Cambridgeshire* London: 165

120 CRO P116/6/9 is the faculty for the new bell frame to be erected by John Taylor & Co of Loughborough for £330.

121 Gillett & Johnston records in Croydon Library. Ref AR1/1/2.

122 Pickford, C 1994, *A report on the bellframe compiled for the Historic Bellframes Rescue Recording Project*, Bedford.

123 Everitt, E 1996 *Swaffham Two Churches*, Swaffham Prior: 37.

124 This taken from the note made by the Huntingdonshire Church Bell Restoration Society, which is undated and without sources.

Acknowledgements

I would like to acknowledge the help of the staff of the Cambridgeshire County Record Office, Dr John Eisel FSA and the tower captains and churchwardens who opened their towers to me. I was welcomed in every church except one. Throughout this survey I enjoyed the support and company of Prof. Mike Davies and Chris Clare.

Addendum

Cambridge Holy Trinity
This "frame" is in three tiers with evidence that the saints bell was set higher on a fourth tier.

The lowest tier is medieval and has elbowed x braces and a superstructure. It is a squat version on the St Peter's frame (see Fig, 10d). The middle tier is similar except that it has no medieval superstructure. On top of this tier is a flimsy frame which was probably erected in 1705 when the Newman bells were installed.
(four + s, 5 + s, 5 + s) (trusses 6.s.4, 6.H)

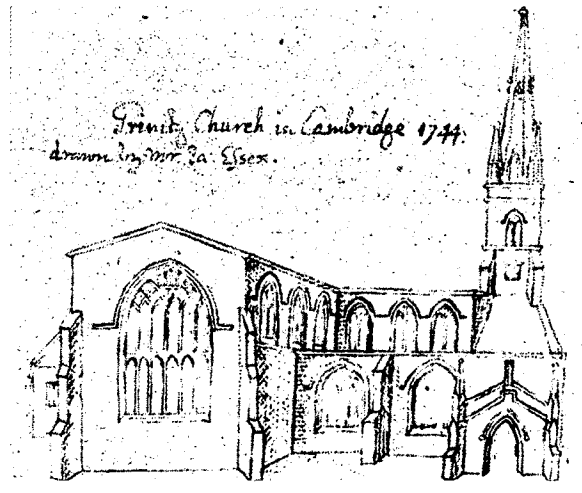


***Plate 3**. Cambridge Holy Trinity as drawn by William Cole.*

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