BROOKLAND BELFRY

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The church of St. Augustine, Brookland, is distinguished by its detached, wooden bell tower, erected close to the north side of the chancel. Its octagonal, candle-snuffer shape was illustrated in 1880 in *Archaeologia Cantiana*,[1] and it has long been regarded as something of a curiosity, its presence being explained by local legend by the marsh soil providing insufficient foundation for a stone tower and its timbers regarded as driftwood. Inspection shows it to be a structure of exceptional interest, of several periods, and it is hoped in this short paper to explain its constructional history and to discuss it within the context of the development of bells and ringing.

The tower itself is basically square with four great, canted posts of oak, each 20 in. square at the bottom tapering to 12 in. square at the top. These posts are placed, 15 ft. apart, on a square frame of four horizontal timbers, with halved joints where they cross, and must be located by some form of peg, although this is not visible. These corner posts are strengthened with a system of lattice braces, which have halved joints where they cross, but have notched-lap joints where they are fitted to the posts. The north face of this tower is shown in Fig. 1. The lower portion of the north-west post is shown in Plate I and a general view of the lattice work is given in Plate II. All four sides of the structure are similar, except that rearing notches exist only on the outer faces of both posts on the north and south sides. The majority of the lattice bracing still exists, and it would appear that the north and south sides were first separately assembled on the ground, both frames then reared and finally the bracing on the east and west sides inserted. To help elucidate some of the problems, the author constructed a timber model to a scale of $\frac{1}{2}$ in. to 1 ft.,[2] and it then became apparent that the centre pair of braces could have been inserted later than the others, and this may represent a strengthening shortly after the tower was built. All of these timbers are heavily weathered, showing that they stood for many years in the open. Its remarkable similarity of form to an electricity transmission tower will be noted, and apparently the tower was constructed for the same purpose—the support of a heavy, swinging load—with the posts in compression and the braces in tension. Notched-lap joints are

[1] W. A. Scott Robertson, 'Churches in Romney Marsh', *Arch. Cant.*, xiii (1880), 480.

[2] K. W. E. Gravett, 'A Model of a Timber Belfry at Brookland, Kent', *Antiq. Journ.*, xlix (1969), 391.

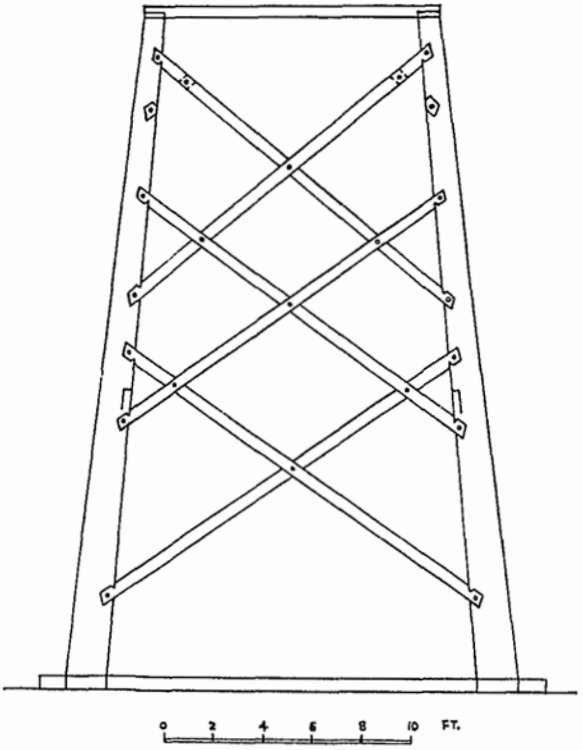
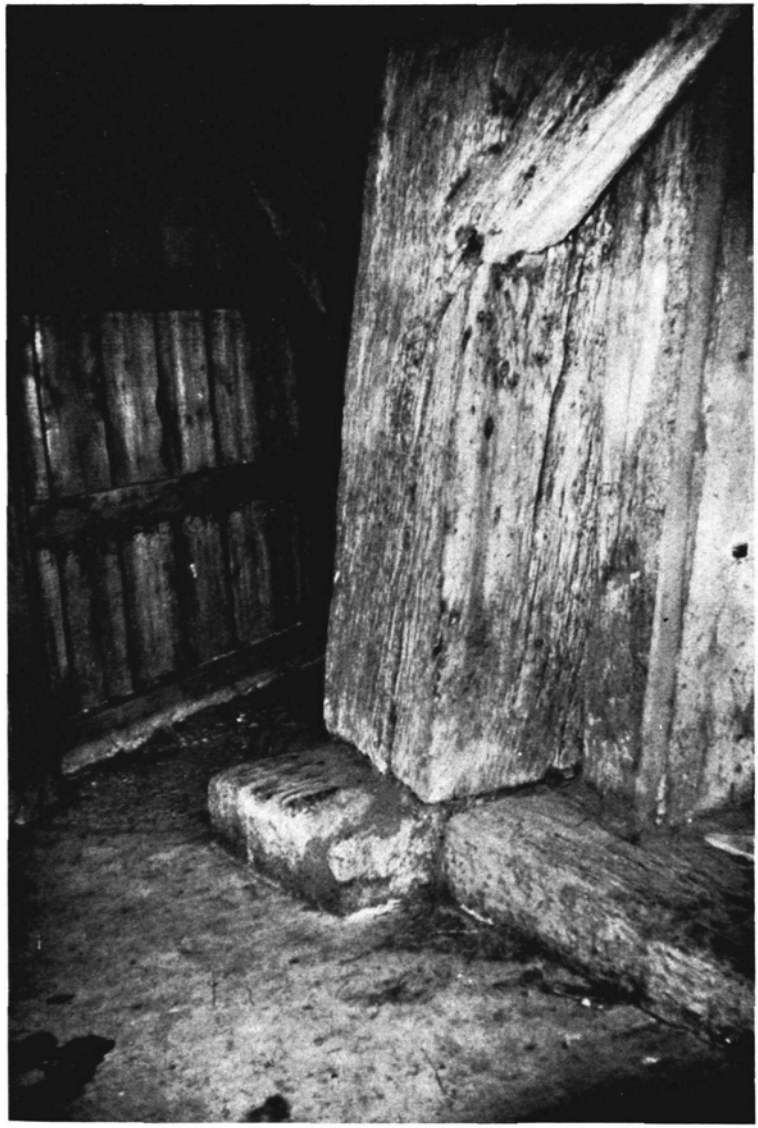


FIG. 1. South Elevation of Original Tower, as existing. (The author wishes to thank the Society of Antiquaries of London for the loan of the block and Mr. E. W. Parkin, for assistance in taking the measurements from which the drawing was made).

ideally suited to withstand tension forces. They may be withdrawn only from the side, unlike mortise-and-tenon joints, whose strength is limited to that of the wooden pin. At present the posts are 25 ft. high. They were cut off in the later development of the belfry (as discussed below), but the lower notched-lap joints for the next pair of braces still exist near the top. However, the taper of both the tower and corner-posts makes a height of greater than 30 ft. unlikely. Presumably, it supported some form of roofed platform and, since there are re-used timbers with weathering similar to that of the braces but too long to fit the existing tower (even if restored to its original height), it is likely that it was wider than the present top. This building is so unlike any other remaining in the County that its presence raises questions as to its use, its date and its geographical significance.

There are two sources of evidence for its date, the sequence of inning of the marsh and the joints. It was long thought that the land around



Brookland Belfry. Foot of the north-west Post, showing notched-lap Joint, at the lower end of a diagonal Brace.

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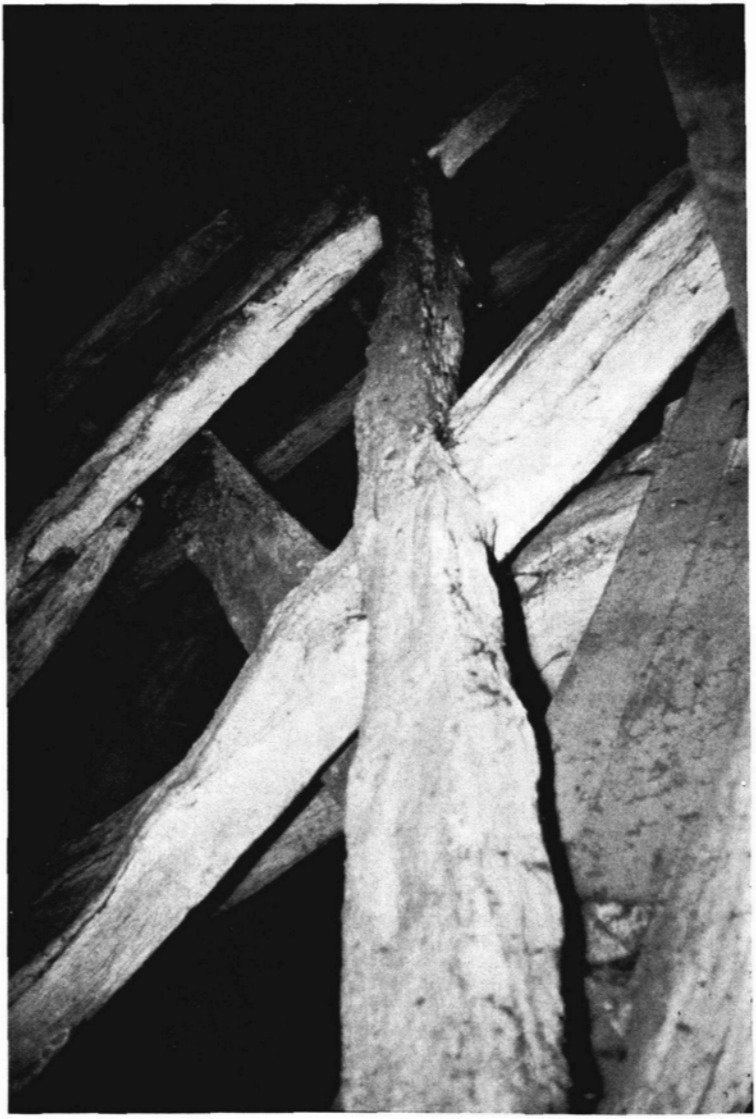
PLATE II



Brookland Belfry. Lattice-bracing on north Side. One Pair of the seventeenth-century Cross-braces is visible behind.

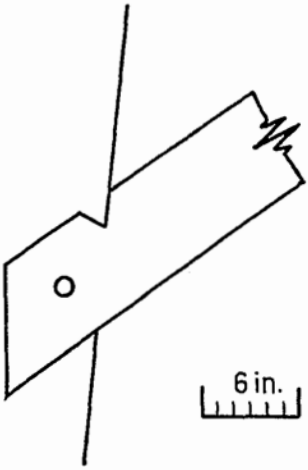


FIG. 2. *Diagram of the lowest notched-lap Joint.*

Brookland was inned in the early thirteenth century, although Misleham Farm is believed to be the successor to Mistanham, mentioned in a charter of 853.[3] This apparent anomaly was recently explained by R. D. Green[4] who, from a study of the lime content of the soil and also the character of the peat deposits, showed that the marsh had evolved as a series of creek ridges, the silting creeks forming higher areas as the marsh dried out, and had been available for settlement from Saxon times, even though the final retreat of the sea was much later. It is significant that both Misleham Farm and Brookland Belfry are on the centre of the ridges, while the church, presumably built later, is on the edge, as demonstrated by the lean of the south wall and south arcade. The church is dedicated to St. Augustine and was an ancient possession of St. Augustine's Abbey, Canterbury.

Notched-lap joints are associated with carpentry of the eleventh, twelfth and thirteenth centuries and exist in two forms, the open form, as at Brookland, and the form where the notch is secret, as at Cogan House, Canterbury.[5] There are over fifty examples known in England and several on the Continent, and their relative dating has been discussed by C. A. Hewett.[6] It is sufficient here to say that the open form appears to pre-date the secret form and both seem to have been superseded by 1300. Additionally, those at Brookland are of the type

[3] J. K. Wallenberg, *Kentish Place Names*, Uppsala, 1931, 170.
[4] R. D. Green, *Soils of Romney Marsh*, Harpenden, 1968, 17 ff.
[5] E. W. Parkin, 'Cogan House, St. Peter's, Canterbury', *Arch. Cant.*, lxxxv (1970), 123.
[6] C. A. Hewett, 'The Notched Lap Joint in England', *Vern. Arch.*, iv (1973), 18.

of open notch described by Hewett as archaic and similar to that found in a twelfth-century level of the excavations at Rayleigh Castle.[7] It is submitted that the first phase of the Brookland Belfry is the building, remaining above ground, most similar in form to the timber tower which once stood on top of a Norman motte. The detached, wooden belfry at Pembridge, Herefordshire, is larger (22 ft. square) and has similar but slightly advanced joints, but the braces have gone.

A wooden tower with canted corner posts and an enlarged stage at the top remained as the west tower at Monks Horton church until last century. A further, most striking parallel is the detached campanile, shown in the Waterworks drawing of Christchurch, Canterbury, of about 1165.[8] This is known to have fallen in the earthquake of 21st May, 1382,[9] but its date of erection is not known. It may have been new when depicted on the plan, for Prior Wibert presented a large bell 'in clockarium', which required thirty-two men to ring it, although Lanfranc had erected a bell by 1077.[10] Certainly, the detached timber bell tower represents an ancient tradition, having existed, for example, at Salisbury, Winchester, Norwich, Worcester, and Chichester Cathedrals and at the Abbeys of Westminster, Battle, Romsey, Tewkesbury and St. Augustine's, Canterbury, itself. A timber structure, being more flexible than stone, is better suited to take the considerable stresses caused by swinging a heavy bell, and the form of the Brookland steeple is better engineering design than many of its successors. Contemporary stone towers were not intended for large bells, but for chapels; for example, there is evidence of a first-floor altar in the great, Norman west tower at Brook. It was only later that large belfry stages appeared in stone towers.

Stahlschmidt[10] traces the history of Prior Wibert's bell at Canterbury, showing how the metal was re-used in the subsequent recasting of the bells, and gives good evidence that the weight was eight tons. Following a similar argument and assuming that the fifteenth-century peal was rather smaller than in the seventeenth century, it may be estimated that the Brookland bell was about two tons and required eight men to ring it. These early bells were taller and thinner than seventeenth-century (or modern) bells and would have sounded duller. They swung through a small angle ($\pm 10°$) and, in the case of a heavy bell, had planks fitted at right angles to the top of the bell-stock and these were treadled by a team of men, who climbed the tower and worked above the bell. A two-ton bell of this type would be approxi-

[7] E. B. Francis, 'Rayleigh Castle: New Facts in its History and recent Exploration on its Site', *Trans. Essex Arch. Soc.*, xii (1913), 159.

[8] Reproduced in *Arch. Cant.*, vii (1868), 196.

[9] C. E. Woodruff and W. Danks, *Memorials of the Cathedral and Priory of Christ in Canterbury*, London, 1912, 165.

[10] J. C. L. Stahlschmidt, *The Church Bells of Kent*, London, 1887, 192.

mately 10 ft. long and 6 ft. in diameter, and there would be room for this and also the two teams of four men on each side on the platform on the top of the tower. Such a bell would sound about lower C and could only swing as a compound pendulum and ring approximately once every one-and-a-quarter seconds. No control of its swinging in the modern sense would be possible. It may perhaps be thought of as an alarm bell for the marsh, rather than as a church bell, and its presence at Brookland on the edge of their great manorial possessions may be due to its erection by St. Augustine's Abbey.

Sometime in the fifteenth century, Brookland belfry was completely reconstructed as an octagonal building. This may have been undertaken because of new ideas in bell-ringing or due to some form of partial collapse. If a platform on the top of the tower is postulated, this would require brackets to support its outer edges, and the extra joints near the top of the uprights may have caused weakness. This would explain why a few feet were cut off the original structure in the rebuilding. About this time, bells were fitted to half-wheels so that they could be rung by a rope. It was possible to ring a number of bells in sequence, previously determined and repeated, a method known today as 'Devon Change Ringing', but not to alter the order of the bells within a sequence (or 'change' as it is called) without stopping. Whichever the reason, the old free-standing tower was cut down to a height of 25 ft. and capped with a simple, square frame of halved timbers. Four re-used timbers, presumably from the top stage, as they are larger than any missing braces, were fixed horizontally at head height, one on each side, by a mortice-and-tenon joint at one end and a bracket at the other. From each of these, two tie-beams run horizontally and at $22\frac{1}{2}°$ to locate the centres of each of the two sides of the new octagonal ground floor. Each side of this consists of two arch-braced bays and weathering on the outer faces of the braces shows that these arcades were originally open. An octagonal frame was fitted on top of the old tower and long rafters ran down from this to the wall-plates of the octagon. These rafters were covered with weatherboarding. Above the top of the tower four more vertical posts were framed and the octagonal structure repeated. Finally, an octagonal spire was fitted, giving the outside shape seen today. These timbers remain almost complete and *in situ*, a testimony both to the skill of its builders and to the excellence of their design. Above the old tower a bell-frame of Elphick's type K was constructed.[11] Since the bells were now in an enclosed space and rung by a rope from below, a floor was inserted as an acoustic hood and supported by four canted uprights on each of the east and west sides, within the lattice-work of the old tower. The present third bell was cast by Henry

[11] G. P. Elphick, 'Sussex Bell Frames', *Sx. Arch. Coll.*, lxxxiv (1945), 37.

Jordan, of London, sometime between 1442 and 1468,[12] and this probably dates the new work on the belfry.

At the Reformation only one bell was left. About 1620, the new practice of hanging bells on complete wheels, so that they could revolve through a full circle, made possible change ringing as it is known today. Bell-ringing became a fashionable exercise for gentlemen, and societies began to be formed. It is believed that a peal was rung at St. Sepulchre's, London, in 1689, while a board in the tower of St. Peter Mancroft, Norwich, records a peal of 5040 changes in 1715. This activity culminated in the ringing of 40320 changes (a complete permutation on eight bells) in 27 hours at Leeds Church in 1761.[13] As part of this revival, the missing Brookland bells were replaced in 1685, when four were added by John Hodson, of London and St. Mary Cray.[14] He installed a frame of type P just above the floor and below the top of the old tower, which was strengthened by great pairs of cross-braces on the north and south sides.

The belfry has required attention since. Before the last war the structure was strengthened and the weatherboarding replaced by cedar shingles. In the autumn of 1973, new cross-bracing was introduced into the supports of the floor and a new bell-frame fitted. Unfortunately, the tenor bell of 1685 was broken up and recast as two. How a faculty for such vandalism may be obtained in 1973 (or such action contemplated by a member of the clergy), in a Grade 1 listed building, is a matter of great concern for the archaeologist.

[12] J. C. L. Stahlschmidt, *op. cit.*, 44.
[13] E. Morris, *The History and Art of Change Ringing*, London, 1931, 130.
[14] J. C. L. Stahlschmidt, *op. cit.*, 189.