

# Evidence for an Intermediate Stage between Earth-fast and Sill-mounted Posts

by

C.A. HEWETT

*This paper draws attention to recent evidence for both earth-based and earth-fast posts in standing buildings. Using Essex examples, the author argues a development from the earth-fast post, through an earth-based sequence to the sill-mounted structures that were universal by the end of the Middle Ages. Field evidence is supported by documentary references and absolute (14C) dating.*

## INTRODUCTION

The numerous excavated vestiges of timber structures, from the first English settlements to the early thirteenth century, have admitted of only hypothetical reconstruction.<sup>1</sup> Many of these structures involved earth-fast posts, either independent bearing-posts or those integral with a wall-structure. Earth-fast posts, in indirect contact with the soil, but not penetrating it, were less easy to detect. This paper records recent discoveries of bearing posts, still standing, earth-based rather than earth-fast, with secondary members jointed to their upper parts, or with the seating for their attachment well preserved.

At the church of Greensted-juxta-Ongar, Essex, the logs were certainly earth-fast. This building is recorded in a document the date of which is disputed but which can be no later than *c.* 1300<sup>2</sup> and which has been much quoted—*Apud Aungre hospitabatur vero ejus nomine lignea capella constructa permanet usque hodie*—which seems to refer to Greensted church.<sup>3</sup>

Excavations at Greensted in 1960 proved the original existence of an earth-fast north wall to the chancel and it is therefore reasonable to assume an earth-fast construction throughout.<sup>4</sup> Figure 1 shows perspective sections of three posts at the south-west corner. This corner-post was cut internally to the right-angled wall-junction and provided with grooves for draught-excluding fillets; the top was worked obliquely to meet the pitch of the roof, with tenons cut at angles, on two different planes, to receive wall-plate and gable rafter. Had this been simply an excavated site the circular post-holes would have told us nothing of the superstructure. Here is a wholesome

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Cecil Hewett is Consultant Adviser on medieval buildings to Essex County Council and the author of several books on historic carpentry.

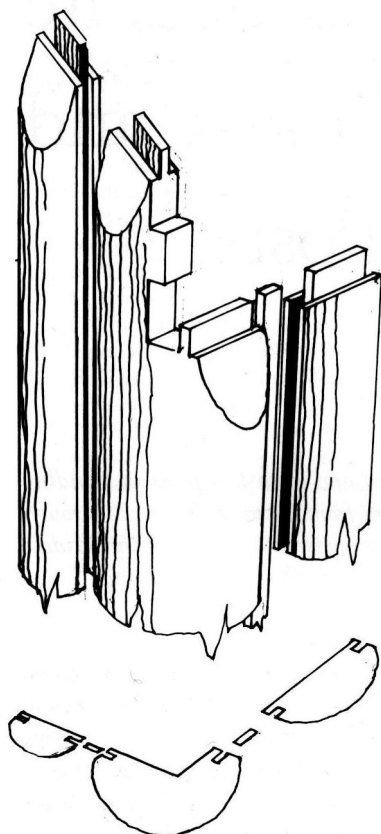


Fig. 1  
South-west angle-post of the log-walled church  
at Greensted, Essex

lesson to those who might be tempted to suppose that a post may necessarily be of the same section from base to top.

An arguable exception, where something of the superstructure at least remains, is the problematic fragment, probably of the late eleventh century, from Rayleigh castle.<sup>5</sup> This early fortress is one of the few strongholds mentioned in Domesday. It therefore follows that the castle must have been built some time between 1066 and 1087.<sup>6</sup> The flat-bottomed post had been earth-based, and must date from before the universal use of lap-joints and the appearance of open-notched lap joints (Fig. 2).

#### THE BARN AT PAUL'S HALL, BELCHAMP ST PAUL, ESSEX

The barn belongs to one of the ancient manors of the Dean and Chapter of St Paul's Cathedral, London. Remarkably detailed farm leases for these estates have been preserved, some of which were published by Archdeacon Hale. In the case of Paul's Hall a lease from the time of Dean Hugh de Marney, 1160-81, survives.<sup>7</sup> The only barn now at Paul's Hall was subjected to 14C dating in 1978, giving a centre date of AD 1026 and a dating range of AD 931 to AD 1121.<sup>8</sup> There are two posts, only



Fig. 2  
An earth-fast post at Rayleigh Castle, Essex  
P. Richards

one of which, at the east end, is complete showing the cut from which a sample was taken for dating; it has earth-fast shores illustrated in figures 3 and 4. Figure 3 shows the back, side and front of the post to scale, figure 4 illustrates the chained raking-shore.

The north-south orientated barn, seven bays long, displays an amazing series of developments; it preserves one original scarf<sup>9</sup> and some studs which are probably earlier than the 14C date cited above. This barn was extended to seven bays after the jowl came into use *c.* 1255. Two posts were cut down and re-orientated south-north, but the eastern post—still on ‘cement’—had been turned through ninety degrees and a new mortise for the arch-brace made. This was the corn granary, *in altitudine autem sub trabe est unius pertice*.<sup>10</sup>

Figure 4 illustrates the floor beneath the post: a light covering of earth separated from the natural clay by a layer of chaff. The arcade post rests on mortar about four inches below the present surface. The floor level between the arcade post and the aisle wall forms a hollow, dipping into the natural clay. This hollow was found to be surrounded and lined by a cluster of cobbles, its angular shape suggesting that it may originally have received the truncated lower end of a shoring-brace rising to the arcade-post. If so, such an insecure construction would have needed cobble packing to tighten it. Although the cutting was taken to the aisle wall and considerably deepened, no further early features were recognized. When the loose, dry, friable material from the north face of the base of the post was removed by hand, a distinct ‘tide-mark’ on the vertical surface was revealed, indicating prolonged burial of the foot, and noticeable erosion and decay below the mark. The base of the post was both perfectly flat and horizontal, as though pared or ‘shot’ with a plane; immediately beneath lay the mortar surface, cracked by prolonged compression.

A fragment of the mortar pad under this post was submitted to Dr C.A. Price, of the Building Research Advisory Service, who reported ‘I have now examined the

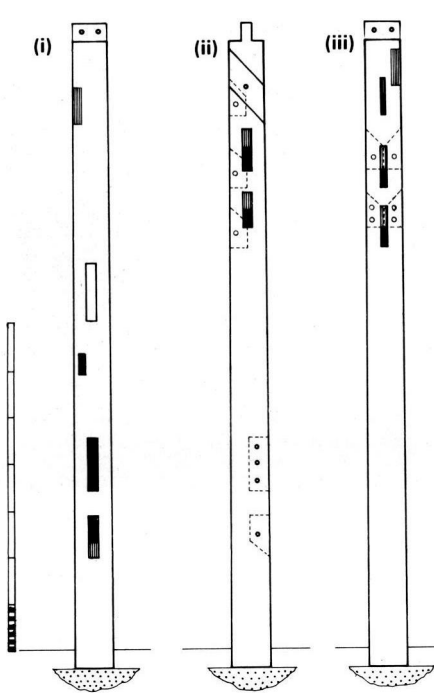


Fig. 3

(Above) A post of the barn at Paul's Hall,  
Belchamp St Paul, Essex, showing the back  
(i), side (ii) and front (iii)

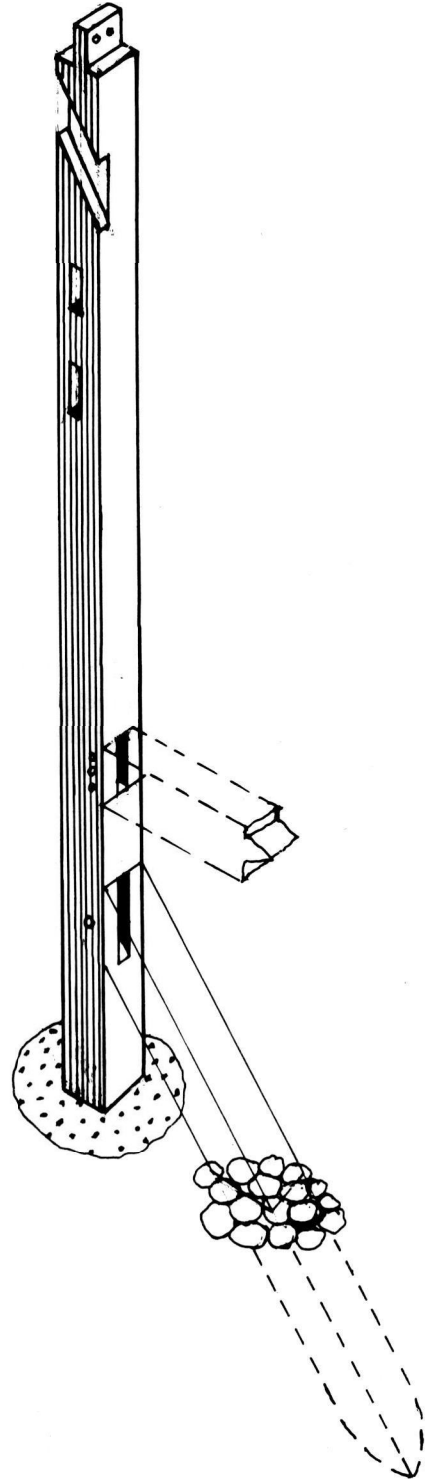


Fig. 4

(Right) The chained raking-shore in the barn  
at Paul's Hall, Belchamp St Paul, Essex

sample . . . and can state without doubt that it is not a natural stone. It is essentially a lime concrete, consisting of lime and an aggregate that ranges from sand to pebbles some 20–30 mm. in diameter. The lime will have carbonated over the centuries; the material effervesces freely in dilute acid, until only the aggregate remains'.<sup>11</sup> This analysis disposes of the possibility that the post rested on the denatured debris of a padstone.

Having then established, by following the downward angle of the departure of the rising shore—which was probably as massive as the post itself—that none of its timber remained, a further test was made by continuing the excavation outside the lateral wall to a depth of three feet, in case the inclined and cobble-packed depression had been no more than a temporary footing at the time of the rebuilding of the wall. No trace of any lower and earlier penetration of the ground was found.

Beside the seating for the raking-shore, a long mortise, 6 ft. 1 in. above the mortar floor, and suitable for timber of about the same scantling as the post, seems to indicate an outshot tie or strainer. The posts themselves are cut from young oak $\text{s}$ , slightly tapered, as grown, and used the natural way up. The sole connection with the ground was evidently by means of the rising-shore. This, it is proposed, was earth-fast, driven as far as the resistance of the clay would permit. It was then cut to an upper chase-tenon, on to, and against which, the post could be reared, earth-based, on a thin artificial pad. It would have remained adequately stable for the remainder of the prefabricated frame to be added, the ultimate stability, of course, being concentrated about the level of the top-plates.

The highly compacted mortar cannot be demonstrated to extend over an area much more than that of the foot of the post, which lacks evidence of safeguard against sideways displacement, such as a pintle or iron spike. It appears that the post had a mortar pad that had become consolidated but could not be precisely differentiated from the friable mortar, not unmixed with earth or necessarily subsequently undisturbed, which was added to level up the floor around the post itself to a depth of five or six inches, thus making the post, in a sense, earth-fast, but not in the sense of being sunk in a post-hole.

#### FAULKNER'S HALL, GOOD EASTER, ESSEX

This is represented today by a complex of farm buildings north-west of the parish church, the main group—and the most relevant building to the present enquiry—lying along the street leading north from the church. Here is the structure long known locally as the Maltings and presumably serving that purpose at some date. It is now of L-plan form with walls clad in black weatherboard and the roof covered in corrugated iron. The east-facing range has a barn-like appearance owing to the presence of a gabled midstrey, a structural addition.

The parish was 'of old called the Prebend of Good Easter . . . because wholly appropriated to the college of St Martin's' (St Martin-le-Grand, London). 'Four prebendaries had their corps or endowments in this parish; named Paslowes, Imbers, Fawkeners and Bowers. And to each of them belonged a house there, viz. Fawkeners, on the south side of the church . . .'.<sup>12</sup> These were prebendal manors and probably date, in their enduring form, from 1158, when the endowments of St Martin were

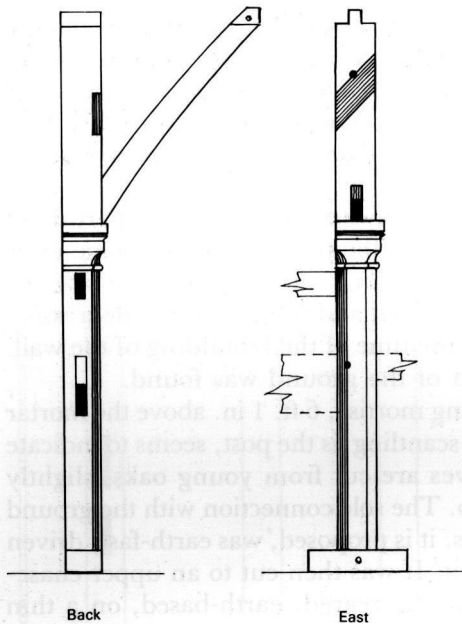


Fig. 5

A post in Faulkner's Hall, Essex, showing the wooden pad

reorganized and the connection of the collegiate foundation with the Honour of Boulogne to some degree broken.<sup>13</sup> Morant's south position is erroneous; that there is no mistake of identity is evidenced by a coloured estate map by Samuel Walker, dated 1623,<sup>14</sup> which shows the existing buildings almost as they stand today, except for the replacement of the capital house by the present early nineteenth-century structure.

Although the building had been known to him for many years, the writer had no opportunity to inspect the Maltings in detail before the late 1960s, when its complexity and interest were at once apparent.<sup>15</sup> The structure appears to comprise the main posts of a three-bay hall, which carry capitals of evidently Romanesque form. The building was certainly aisled on both sides but not heated by any known method (unless by a wall fireplace) since all original timbers are of naturally-coloured clean oak, without any traces of sooting. The main span between the capitals is 17 ft. 5½ in., but the original widths of the aisles are unknown. The curvature of the arcade braces is slight (only ¼ in. in an overall length of 8 ft.). A typical capital is illustrated in figure 5. Although formed mainly by slightly hollow chamfers, the accurate carinate fillet, immediately beneath the abacus, has affinities to that widespread and persistent Romanesque feature in stonework seen, for example, in a series in Winchester Cathedral. There, in the south transept triforium, the feature may be as late as in the present choir vestry of the 1170s. The actual form of the capital, however, seems to be a purely timber idiom, not exactly paralleled in any known early hall. Its chronological significance at Faulkner's Hall has yet to be determined, but it is not inconsistent with a date somewhere near the reorganization of the prebends in *c.* 1158.



The post stands on an oak pad some nine inches by five inches.

A further example with wooden pads is to be found at Crepping Hall, Wakes Colne, Essex,<sup>16</sup> now a house, where there is one wooden post with a capital moulded like those of Selby Abbey nave cross-arch and dated *c.* 1150.<sup>17</sup> Other examples are to be seen in three barns of about twelfth-century date: Great Barton Manor House and Alpheton Hall, both in Suffolk; and the biggest barn at Coville Hall, White Roding, Essex.

#### BARN AT GRANGE FARM, LITTLE COGGESHALL, ESSEX

This is a large, but considerably altered, barn situated under a mile from the Savignac abbey of Coggeshall on which it was dependent, a royal foundation of 1140,<sup>18</sup> taken into the Cistercian connexion in 1147. The proximity suggests a slightly remote *curia* of the main settlement rather than a typical detached Cistercian grange and 1140 is a valid *terminus ante quem* for its building. That it must have been constructed within a few decades of this date is evident from the archaic features, such as the refined angle of the notched lap-joints<sup>19</sup> that occur in the main range of arcade-posts, most of which survive from the primary build. One post was dated by 14C to  $1130 \pm 60$ .<sup>20</sup> In 1985 the barn—by then collapsed—was restored. Most of the great posts, on average sixteen inches square at the base, stood on great stone stylobates only one of which was not removed when the top-plates were reused after *c.* 1375.<sup>21</sup> The bases of prostrated posts were observed to be either 'pared' or 'shot' with a plane to a perfect surface at right angles to the taper of the post, which was that of the tree as grown,



Fig. 6  
The base of the post, and  
stylobates, Grange Barn,  
Coggeshall, Essex

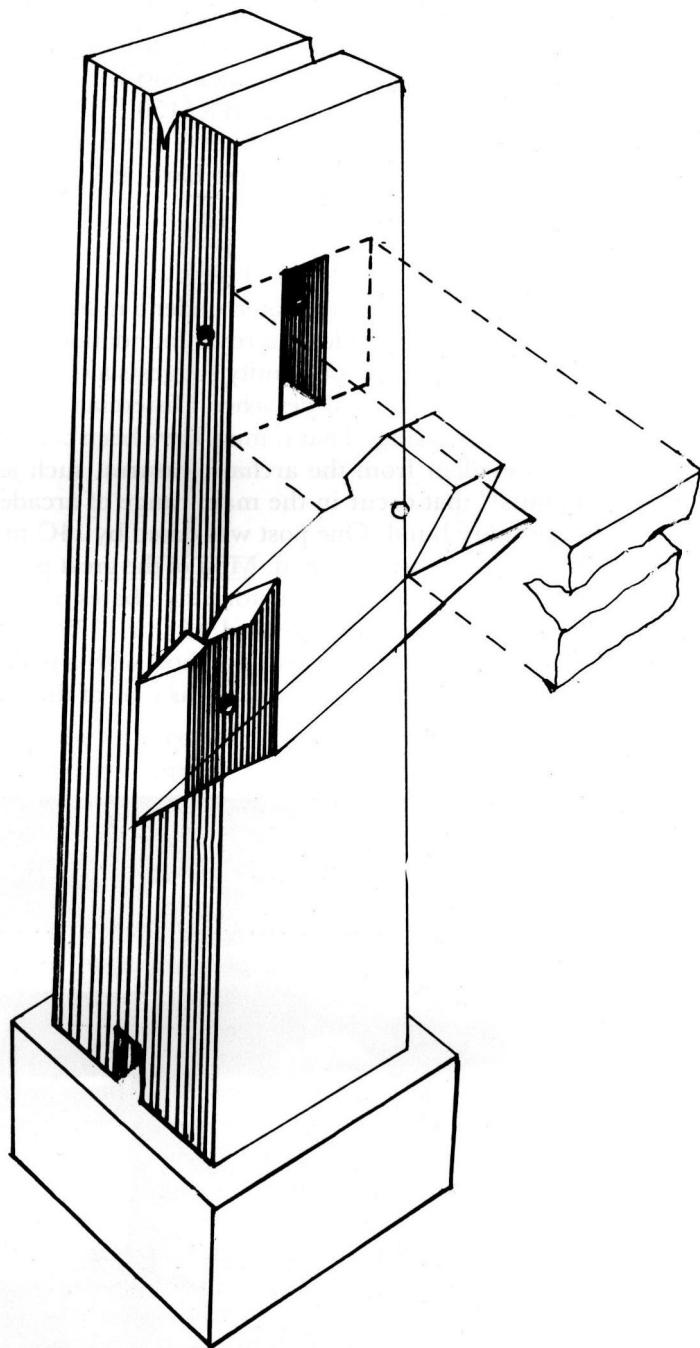


Fig. 7

A post from Grange Barn, Coggeshall, Essex, showing stylobates



with no trace of any form of jointing into the standing (Fig. 6).

Mr Martyn Owen of the Geological Museum, London, reports on the stone stylobates: 'The specimen . . . is a rather brownish, crystalline shelly limestone and matches well with the specimens in our collections from the Middle Purbeck of Dorset. It is not of Purbeck Marble, which is Upper Purbeck, but from the underlying strata which have been extensively used in building stone'.<sup>22</sup> By the 1170s diffusion of stone from the Purbeck quarries was widespread, facilitated perhaps by royal interest. Figure 7 shows a post with a stylobate, an outshot tie-beam and the 'refined' form of the open notched lap-joint.

Two further examples with stone stylobates are Temple Balsall, West Midlands, and Nursted Court in Kent. At the former the posts are described as 'standing on stone plinths, and inclined slightly inwards'.<sup>23</sup> Its date is not known but the manor was granted to the Templars in the reign of Stephen (d. 1154).

At Nursted Court, so far undated, the two posts are on stone stylobates and the two capital mouldings are of the half-roll type with frontal fillets, dated c. 1220-1300. The house was used by John de Fienes, baron of Assize, from 1212.

#### THE BARLEY BARN, CRESSING TEMPLE, ESSEX

This most impressive barn, at a site whose documentary *terminus post quem*, early in the reign of Stephen and the gift of Matilde of Boulogne, is much the same as Coggeshall and has often been described in print.<sup>24</sup> Recent examination has clarified details of the standing of the posts on the post-plates, or transverse sole-plates, and established that the post at the northern corner, although the most depleted in respect of its complementary bracing, is that which occupies its original standing. The foot of the post (Fig. 8) is shown with basal tenon and complementary mortise, and carefully plugged side sockets. The purpose of the latter was probably to take the 'trunnions' used to steady the feet of the posts during rearing, thus ensuring that the tenon entered the mortise accurately.<sup>25</sup>

The dating, based on radio-carbon evidence, has already been discussed elsewhere.<sup>26</sup> The typological evidence suggests a date rather earlier than that of c. 1200 postulated by Berger and Horn.<sup>27</sup>

#### COMMENTARY

Between c. 1087 and c. 1255 there were various different ways to stabilize a structure and by c. 1255 the 'new' ways had become traditional. The twelve examples cited in this paper show the sequence from earth-fast to sill-mounted posts, as at the Wheat Barn, dated c. 1255 by 14C. Different orders were used for assembly, one of the first being at Rayleigh castle, where the earth-fast posts belong to the period 1066-87. Posts here were probably held about three feet down by ramming carefully until they were correctly positioned, the vertical columns being stabilized by top-plates and bracing.

There is only one surviving example of a ramped earth-shore, a single post in Paul's Hall Barn dated 1121 by 14C.<sup>28</sup> The post will stand freely as soon as it is morticed to the earth-shore on its dry cement. It can then be stabilized by the outshot tie-beam, the main span of the top-plates and tie-beams.

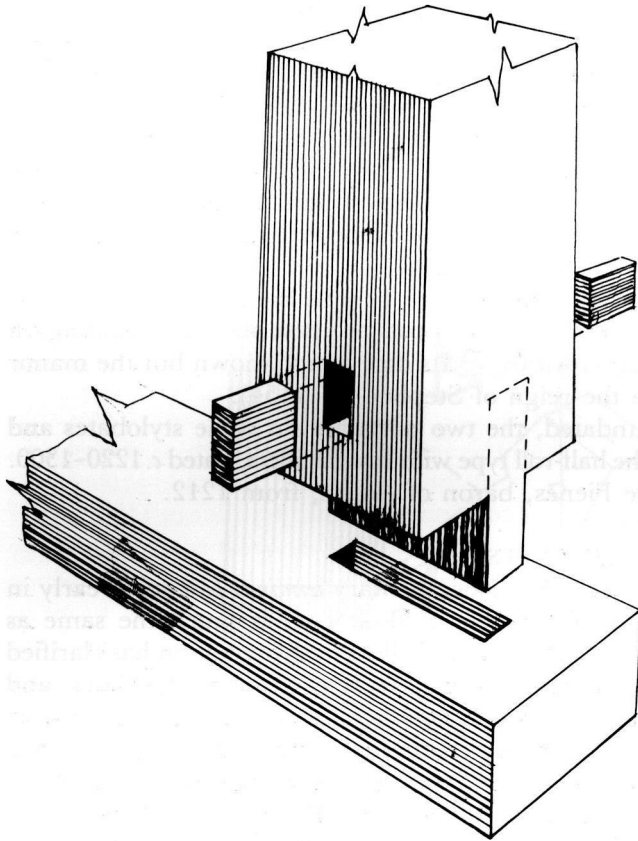


Fig. 8  
A post from Barley Barn, Cressing,  
Essex, showing the sill

The barn at Grange Farm, Coggeshall, Essex, carbon dated to  $1130 \pm 60$ , has stylobates with 'reversed assembly'. The posts were stabilized by the outshot wall top-plates, following which the main span was given its top-plates, then the braces were mortised at the bottom, and finally the top-plates were notch-lapped.

At the Barley Barn, Cressing, Essex, oak sills are mortised to the ground-sill, one of the first such known to be used in England and dated by 14C to  $c. 1200 \pm 60$  AD.<sup>29</sup> The rearing of posts was difficult as they were both high and heavy, almost twenty-five feet long, fifteen and a half inches square at the bottom and ten inches square at the top. The present outside wall is not original. The early wall was probably under the top-plate. As reversed assembly is used, the posts would be held in place as soon as the top-plate was fixed. The first to be erected and stabilized were the four middle posts, followed by the two straining beams, free tenoned to the posts. The two top-plates were mortised by holding the already tenoned braces by rope passing through holes in their sides. This is the first recorded use of this method. The tie-beam could then be offered and pegged. All arch braces had notched laps and were offered by sidewise jointing as in Temple Balsall.

The Wheat Barn, Cressing, Essex, is dated by 14C to AD 1255.<sup>30</sup> Here is the first recorded use of the jowl,<sup>31</sup> and, in the original north aisle, or outshot, of 'normal' assembly. Subsequently, all constructions were 'normal'. Carpenters were now able to rear without trunnions to secure the bottom of the post, and bracing with mortise and tenons, without notched laps, could be done at the same time as the main span top-plates.

Of a completely different order of assembly is the reversed assembly of Great Coxwell barn, Berkshire, dated not later than *c.* 1250. A later example is that of the barn at Belchamp St Paul's, Essex, dated by 14C to *c.* 1400, showing that the method was still in use at that date. This was a much simpler method of assembly.<sup>32</sup>

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