Chapter 8

A NOW-LOST FOURTEENTH-CENTURY AISLED BASE-CRUCK BUILDING AT KETSBY HOUSE FARM, LINCOLNSHIRE, AND ITS CONTEXT

MARK GARDINER and JENNE PAPE

ABSTRACT Twenty-seven photographs provide the only record of a timber building demolished in 1966 which stood near the site of the deserted village of Ketsby (Lincolnshire). Close examination of these suggest it was a barn with base crucks and aisles, a type of building constructed in the period 1275 to 1350. The timbers used were of very poor quality which had evidently come from hedgerow trees rather than closed woodland. Many of the timbers were used in the round with the sapwood, which was prone to decay, and some even with the bark which was still present when the building was demolished. That suggests an extreme economy in the use of timber rarely seen elsewhere in late medieval England. It implies that there was little wood available, even for the construction of a complex building. The study of this rare timber building from Lincolnshire indicates why so few other such structures have survived in the county: the quality of material that carpenters had to use was so poor that all such buildings would have been particularly susceptible to structural failure and decay.

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Introduction

In some counties of England, the number of surviving late medieval timber buildings is in the high hundreds or even thousands. Such buildings are particularly common in the southeast of England. In the Rape of Hastings in eastern Sussex, it is estimated that perhaps as many as one in seven (14 percent) of all buildings standing in 1524 on rural holdings above fifty acres still remain. These were, of course, some of the more wealthy farms, but even on smaller holdings of between fifteen and twenty-five acres, where the buildings were less substantial, the survival rate after five hundred years is as much as 4 percent.[1] By contrast, the number of standing late medieval timber-framed buildings in the whole of Lincolnshire, outside the main urban centres of Lincoln, Grantham, and Boston, may total fewer than ten. Further investigation may increase this number, but it is clear that the number is very small. The low survival rate of medieval rural buildings within this very large county is quite exceptional across England, and largely unexplained. However, by examining what does survive, we can begin to understand the reasons for this and obtain some idea of what has been lost.

The timber-framed barn at Ketsby Manor Farm in eastern Lincolnshire was demolished in 1966, and the site is now occupied by a modern farm building. Its importance was recognized before it was dismantled, and eight photographs were taken by an unknown individual shortly before it was taken down. A further two sets of photographs were taken subsequently, one by Lincoln Historical Society's Industrial Archaeology Group, and the other shortly after by the Royal Commission on Historical Monuments, who also made brief notes of the dimensions.[2] They show the build-

* The authors are grateful to Richard Watts who provided them with the detailed scans of the records of the Lincoln Historical Society's Industrial Archaeology Group and has been helpful throughout, to John Walker who advised them on rotated jowls in East Anglia, and to Nat Alcock and Nick Hill with whom they discussed the orientation of timbers. The University of Nottingham's Manuscript and Special Collections made a preliminary search for them of Maurice Barley's papers. The study was made possible by a grant from the University of Lincoln's Research Resources Allocation Fund for the purchase of high-resolution copies of the photographs from the Historic England Archive, Swindon.

1 Briscoe et al., *How Houses Evolved*, 16.

2 The eight pre-demolition photographs and the site records of the Lincoln Historical Society are held by the Historical Environment Record of Lincolnshire County Council; the records of the Royal Commission on Historical Monuments are now held in the Historic England Archive at Swindon.

Figure 8.1. Building at Ketsby, Lincolnshire, UK. A view looking eastwards to the north side. Photographer unknown, 1966. Historic England Archive. Reproduced with permission.

ing in the weeks before it was finally levelled. By the time these photographs were taken, the roof had been removed and work was proceeding to take down the timber frame. The brick walls, which had replaced the original timber sides, still stood, and the interior of the barn was covered with manure (Figure 8.1). The twenty-seven photographs from these three sets provide the only known record of the building. There has been little subsequent discussion of it, and detailed examination of the photographs does not provide as much information as could have been gathered from the standing structure, but they do allow us to determine most of the crucial details of the building, and to reconstruct its form. This article seeks also to date it and place it in context. Before that can be done, it is necessary first to describe the structure.

Building Description

The building had four bays formed by five trusses with one, or possibly two, end (or return) aisles. It was aligned east-west and the trusses here are numbered from west to east, following the carpenters' original numbering discussed below. The nave (or central portion of the building) was 5.94 m wide with two side aisles each 1.11 m wide. The building was 15.06 metres long with an additional end aisle 1.52 metres wide. It combined the use of crucks, which are curved timbers standing on or close to the wall-line, with aisle posts set in the interior of the building and away from the walls (Figure 8.1). Lincolnshire lies to the east of and beyond the zone of full crucks, a well-defined region of western and northern England.[3] In full cruck buildings the blades (curved timber posts) extend upwards to close the apex of the roof. However, Trusses 3 and 4 at the Ketsby building are base crucks, a rather different form of structure (Figure 8.2). Base crucks are more widely distributed than full crucks, and are distinguished by blades which rise only as far as the tie-beam.[4] While the distinction between full crucks and base crucks may seem a nicety of typology, the difference is fundamental, and the two building types may have entirely different origins.[5] The purpose of the base cruck was to create a large span while placing the bottom of the timber posts close to the line of the exterior wall. They are often found in the centre part of buildings where a clear open space was required, typically within a hall where an unobstructed view to and from the high table was desirable. Elsewhere in such buildings, where the need for a fully open space was less important, the weight was carried on aisle posts.

This was the situation at Ketsby: the two base-cruck trusses were set towards the centre of the building and aisle posts were used for the other trusses (Figure 8.3). Truss 1 was formed of a pair of jowled aisle posts linked by a straight, not canted, tiebeam. The posts had straight-braces to the arcade-plate, and pegholes visible in the photographs suggest there was similar bracing to the beam. An aisle tie between the southern aisle post and aisle-plate survived encased in the later brick wall. It was made from a tree branch and was irregular. It is not clear whether the building, when constructed, had continued westwards with an end aisle beyond this last surviving truss. Photographs show the southern aisle post of Truss 2,

3 For a recent distribution map, see Alcock, Barnwell, and Cherry, eds., *Cruck Building*, map A.

4 Meeson, "Base Crucks," 71.

5 Meeson, "Base Crucks," 92.

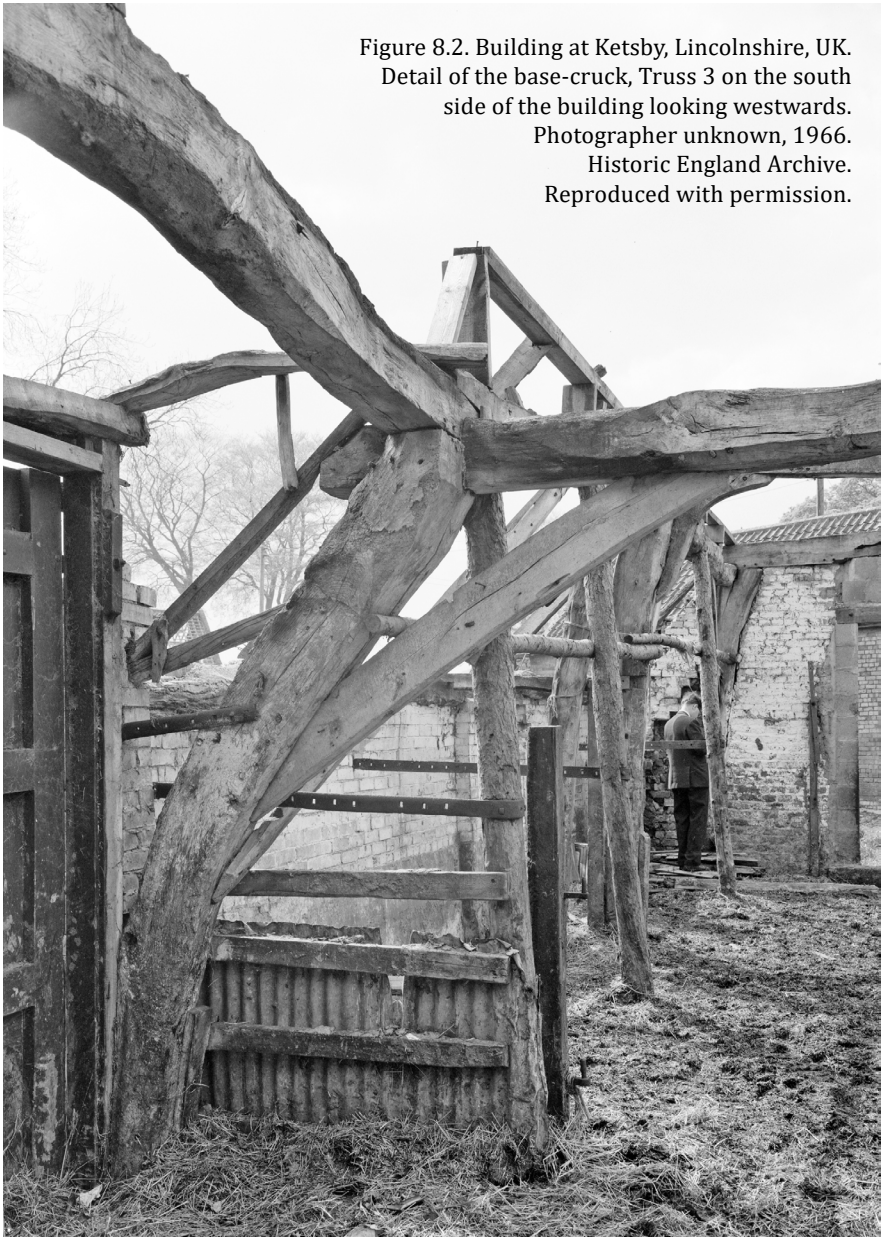

Figure 8.2. Building at Ketsby, Lincolnshire, UK. Detail of the base-cruck, Truss 3 on the south side of the building looking westwards. Photographer unknown, 1966. Historic England Archive. Reproduced with permission.

which was attached to the arcade-plate with two ogee-shaped braces. Empty mortices indicate that there had been a further brace to the tiebeam. The northern post had been replaced. The timber was only roughly shaped, and angled inwards with its foot against the wall as if resembling a cruck. It was irregular, rough, and of small scantling, notably less substantial than any

other cruck blade. The junctions between both posts and the beam had been strengthened with two carefully shaped knees (bracket-shaped timbers).

The two cruck trusses, 3 and 4, had partially failed. This was indicated by the arcade-plate, which was lower in the middle of the building than at the ends. Arcade-plates, which supported the rafters of the roof, were invariably horizontal when built. Truss 3 was a base cruck with straight braces between the blades and the tiebeam (Figure 8.2). There was also a brace on the western side to the arcade-plate, but not on the eastern side. The arcade-plate sat on top of the tiebeam, a form known as "reversed assembly." The tiebeam extended beyond the junction with the cruck blade—further than was necessary to support the arcade-plate, but constructed in this way to attempt to ensure the joint between the cruck and tiebeam did not fail. Truss 4 was almost certainly similar, though the cruck blade on the south side had been replaced with a timber post and nailed-on braces. The number of pegholes in the beam of this truss suggest that the brace, and perhaps the cruck, had been replaced once previously. The significance of that is discussed below. There was no brace on the west side of the cruck on the north side of the building. The tiebeams on both Trusses 3 and 4 were slightly canted. Truss 5 had also survived in a somewhat fragmentary state, with a later post of small scantling replacing an original aisle post on the north side. The southern aisle post, by contrast, had survived well and shows that this truss was identical to that at the opposite end of the building, Truss 1, with braces to the arcade-plate and tiebeam. It too had an aisle tie which rested upon or was morticed into the aisle-plate.

There were traces of a return aisle at the east end. The lateral aisle-plate continued past the last truss and was jointed to an end (or return) aisle-plate. There may have been a similar return aisle at the west end, but this is not certain. However, there is no evidence of an end wall at Truss 1. If there had been a return aisle there, it had been removed before the barn was encased in brick and a later door was formed. The timbers of the arcade-plate, which supported the rafters of the roof, were joined on both sides with scarf joints. These were splayed with sallied vertical abutments and apparently held with a single key and two pegs. When the photographic record was made, little of the frame for the aisles survived. However, pegholes on the surviving lengths of aisle-plate indicate that it had consisted of a series of small posts braced and pegged. The aisle-plate was scarfed at various points to produce a continuous length, except for a space for the southern door. It is uncertain whether there had been a tall northern door; the aisle-plate—apparently original, as it is scarfed at both ends—ran straight across the bay between the third and fourth truss. A door might have been expected here opposite the likely position of the entrance on the south side,

but the aisle-plate crossed the bay some 2 m above the ground surface, and would not have allowed for a full-height barn door. The aisle-plate frame was attached to the arcade posts by aisle ties of widely varying shapes, at a range of heights up the posts, suggesting they were selected once both arcade and aisle were standing.

The original form of the roof is uncertain. A few of the photos taken in 1966 show the remains of the latest roof assembly. This was very lightly scantled, of sawn softwood, sufficient only to support the corrugated iron which was the last roofing material used, but clearly not of medieval date. Some of the other rafters which remained may have dated from the period of construction. They were short, rounded timbers extending from the side aisle-plate to the arcade plate, and one goes from the end aisle-plate to the tiebeam. The only published mention of the building indicates that it had a crown post set on the beams with collar purlins.[6] The basis of that statement is unclear. There were no pegholes towards the upper edge of the tiebeam, which implies that there were no mortices for a king- or crown-post roof. It is more likely that the roof had comprised common rafters with collars, which would have reduced the challenges posed by the mixed assembly. If all the rafters were seated on the arcade-plates, rather than using principals at the trusses, then the varying heights of the tiebeams would not have affected the rafters. The original form of the building above the tiebeam—whether hipped or gabled—is uncertain. It has been shown (Figure 8.3) with a hipped end, which would have helped to prevent racking.

There appears to have been two systems of construction marks used during the building of the frame. Within the body of the frame, scratched truss numbers are visible on many of the posts. They must have started from I at the western end and ended with V at the eastern—although neither the first or last number is visible in the photographs—and they were located on the posts, close to the tiebeam braces. A second numbering system seems less coherent. The numbers IIII, V, and VI are apparent on the southern face of the southern arcade-plate, but with no visible number associated with the post at Truss 5. The IIII is above the cruck blade at Truss 4, the V above the eastern brace from that truss, and the VI above the brace for Truss 5 (with another VI appearing on the brace itself, close to the top). However, this suggests that the numbering does not run the full length of the arcade-plate. The IIII coincides with Truss 4; it may be that the numbers were then used along the length of that piece of arcade-plate in a different way.

6 Alcock and Barley, "Medieval Roofs with Base-Crucks," 159.

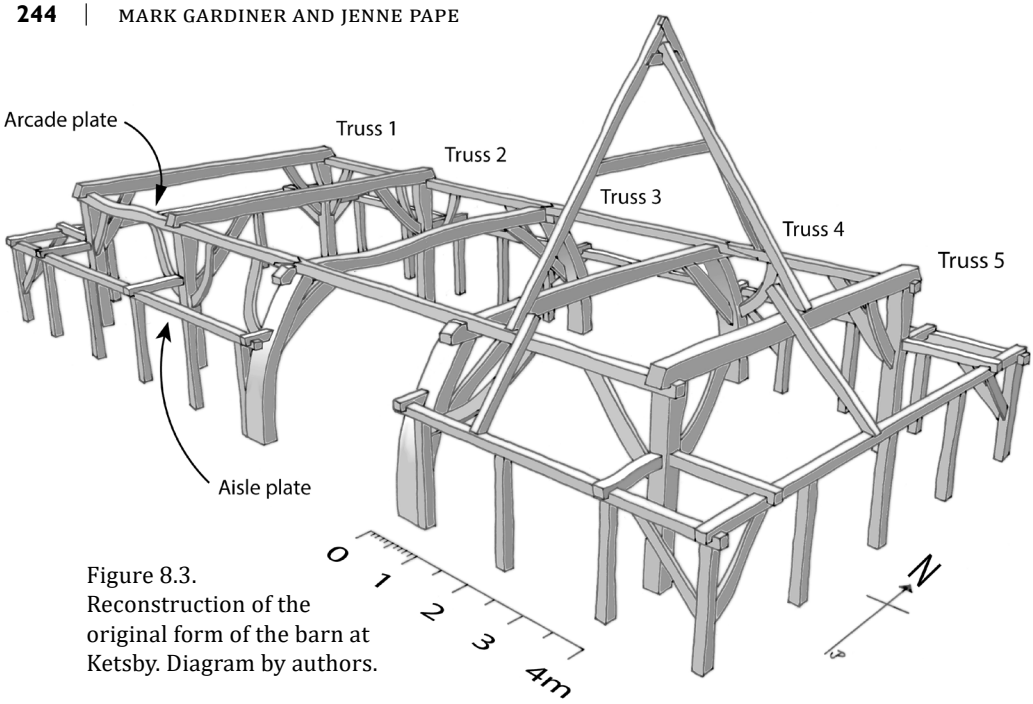

Figure 8.3. Reconstruction of the original form of the barn at Ketsby. Diagram by authors.

Documentary Evidence

The adjoining vills of South Ormsby and Ketsby were both held in 1086 by Earl Hugh, and the two manors descended together in the hands of tenants holding of the earl of Chester.[7] In 1242/43 they were held by Ralph son of Simon of Ormsby as two fees, and after his death they passed to his son Simon, who obtained a grant of free warren for Ormsby, Ketsby, and Walmsgate in 1314.[8] He died before 1320, when his will was proved, and he was succeeded by a further Ralph. When that Ralph died, he left two children, Simon and Margaret: Simon died without offspring, and his sister Margaret, with her husband Sir William Skipwith of Yorkshire, inherited between 1362 and 1369.[9] Sir William died in 1398 after granting the manors to Sir Philip Tilney, his uncle, who in turn died without a son or daughter.[10] The later descent of the manors is not relevant here.

7 *Lincolnshire Domesday*, ed. Foster and Longley, 13/41–42.

8 *Liber Feodorum*, ed. Lyte, 1.167; 2.1063, 1077; *Calendar of the Charter Rolls*, 3:242.

9 Massingberd, *History of Ormsby-cum-Ketsby*, 33; Jurokowski, "Skipwith, Sir William."

10 Massingberd, *History of Ormsby-cum-Ketsby*, 75.

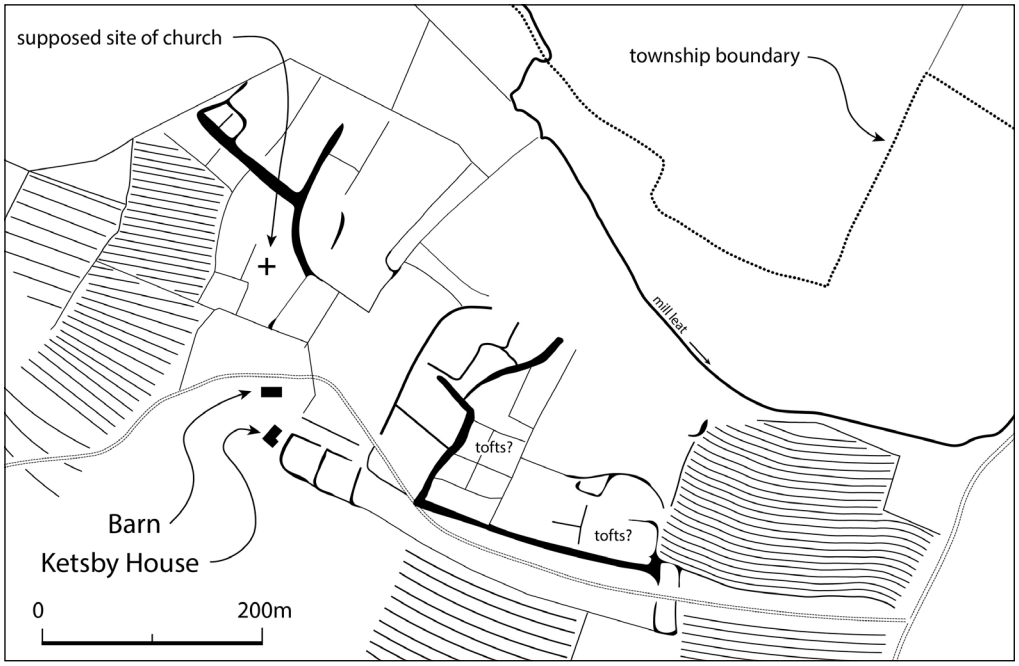

Figure 8.4. The setting of the barn at Ketsby. Diagram by authors adapted from plot by the Historic England National Mapping Programme and aerial photographs taken by Cambridge University Collection of Aerial Photography in January 1966. Other details added from the 25-inch Ordnance Survey map, revised 1905.

South Ormsby was always the more important of the two. It paid three times more tax to the 1334 subsidy than Ketsby did, and the site of the manor house was there.[11] The courts of the two manors were held together. As the population across much of Lincolnshire fell with the conversion to sheep pasture in the sixteenth century, it is likely that the population of Ketsby was much reduced. The central Wolds was the least densely occupied area of Lincolnshire in 1563, and only ten families were noted in Ketsby parish. It was one of the smallest congregations in the county, and can be compared to the thirty families in South Ormsby.[12] The parishes of Ketsby and South Ormsby were amalgamated and the church at the former was demolished sometime between 1552 and 1586.[13]

11 *Lay Subsidy of 1334*, ed. Glasscock, 185.

12 London, British Library, Harley MS 618, fol. 8v; Gould, "The Inquisition of Depopulation," 395; Thirsk, *English Peasant Farming*, 11, map 2; *State of the Church in the Reigns of Elizabeth and James*, ed. Foster, 177.

13 Massingberd, *History of Ormsby-cum-Ketsby*, 332.

The timber building appears to have been on the demesne. The antiquarian W. O. Massingberd, writing in 1893, says at Ketsby "there are signs of old, perhaps fortified buildings and moats."[14] No moat is apparent in the 25-inch map of 1880, and he may have been confused by the earthworks of the deserted medieval village. These are shown in aerial photographs taken in 1966 by Cambridge University as lying to the east of the barn at Ketsby, but they were subsequently levelled by ploughing (Figure 8.4).[15]

Discussion and Interpretation

There are two key issues which need to be examined: the function of the building and its date. A four-bay building with one or perhaps two end aisles can only have served as a hall or a barn. It certainly was an agricultural building by the twentieth century, but that does not preclude an earlier use as a house. The base crucks allowed the central vessel of a house or barn to be bridged without the use of aisle posts, which otherwise would have obstructed that space. In a house, base crucks spanned the space of the hall; in barns, they were used at the entrance to facilitate the movement of carts and the unloading of crops. Towards the ends of the barn, it was possible to use aisle posts as divisions to support stacked unthreshed sheaves.[16] Aisle trusses were used where such posts did not form an obstruction, typically at the ends of a building or, in houses, at closed trusses.

Various indicators suggest that the Ketsby building was constructed from the outset as a barn:

1. There is no evidence for any internal divisions in the building, as none of the internal trusses seems to have been closed. In other words, there were no internal walls.
2. If it had been a house, the hall would have occupied three bays between Trusses 2 and 5. A three-bay hall would have allowed very limited space for the services or, alternatively, for a chamber. We know from the assembly marks that it extended no further to the west and the return aisle (see below) precludes an extension to the east.
3. The east end, and less certainly the west too, was finished with an end aisle. Such an aisle would have been exceptional in a house after the early thirteenth century, but might occur in a barn.

14 Massingberd, *History of Ormsby-cum-Ketsby*, 6.

15 See https://www.cambridgeairphotos.com, reference numbers AMV45–50.

16 Alcock and Barley, "Medieval Roofs with Base-Crucks," 142.

4. There were no lateral braces between the two cruck trusses, 3 and 4. Braces were used in all other positions, for reasons of structural strength, and to aid the assembly of the building (see below). We might have expected them in this bay: the most likely explanation for their omission is that it served as an entrance to a barn. Braces here would have obstructed access by loaded carts.
5. There is no evidence of sooting on any of the surviving beams, which might have been present if the building had been a hall with an open hearth.

Collectively, these points lead to the conclusion that the building was constructed as a barn, with the further implication that it had an entrance between Trusses 3 and 4. An entrance on the south in that position would also explain why the cruck blade of Truss 4 on that side had been replaced at least twice, and more than any other: it would have been exposed to driving rain from the prevailing southwest winds when the door was open, and would therefore have been particularly vulnerable to rot.

The second key issue concerns the matter of date. The majority of dated base-cruck buildings fall between 1275 and 1350. Moreover, all such structures with the arcade-plate set above the tie—a feature found at Ketsby—lie in that date bracket.[17] However, some caution should be exercised. Lincolnshire had a distinctive and rather conservative form of building, and it is therefore possible that the building could be slightly later.

Building Status

A total of 174 base-cruck buildings have been identified in England, of which only 22 are barns. It has been shown by Alcock and Barley that base-cruck construction was used by lay owners of gentry status and above, as well as by monasteries and other religious bodies.[18] The surviving buildings are, of course, only a fraction of the total once erected. Barns have suffered a higher level of attrition than other types of buildings because they have had to survive alterations in the farming economy, with shifts in emphasis on arable or livestock. It is probable that the structures which have been lost were those less well built, and possibly constructed by tenants of lower status. It is unlikely that it is merely chance that many of those remaining had

17 Meeson, "Base Crucks," fig. 4.9.

18 Alcock and Barley, "Medieval Roofs with Base-Crucks," 134–35.

walls of stone. Such walls protected the internal timbers from the weather more effectively, and the use of stone also marks a considerable investment in the buildings. Ketsby is therefore a quite exceptional survivor because it was constructed with limited investment in materials (see below), including using daub and wattle, or its Lincolnshire equivalent mud and stud, for the walls rather than stone.[19] It was built by a rather minor lord, and we should wonder why it remained standing when so many others in the county did not. Its survival must be attributed to its continuing utility as an agricultural building on a sprawling demesne. It was a capacious barn useful enough to be worth maintaining, right down to the nineteenth century when the walls were replaced with brick.

Order of Construction

The combination of normal and reversed assembly typical of an aisled base-cruck building posed some difficulties for the Ketsby carpenters. In normal assembly, the arcade-plate is set into position before the beams are dropped into place. The opposite is true for the cruck trusses: these are erected first, and subsequently the arcade-plate is added. John Walker has shown how this was managed at Frobury Farmhouse (Hants) which had a single base-cruck truss. The aisle posts were erected first, then the central cruck was reared; the arcade-plates were added, followed by the beams to the arcade-trusses.[20] The problem was altogether more difficult at Ketsby because that building, like many medieval Lincolnshire buildings, had no soleplate to secure the foot of the timbers. Its structural stability depended entirely on braces to the arcade plate.

There are three scarf joints at Ketsby, and the direction of these allow the sequence of construction to be determined. The lower scarfed plate was set in place before its upper counterpart, suggesting that the bay between the base-cruck trusses was erected first and the carpenters worked outwards towards the ends and then the aisles. The two base-cruck trusses would have been assembled on the ground, then reared into position (Figure 8.5, A). The difficulty for the builders was that the base-cruck trusses were not braced to the arcade-plate in this bay because of the need to avoid obstructing the cart entrance. During erection, that part of the structure may have been tem-

19 Mud and stud differs in creating a matrix for the daub by attaching riven laths to the outside of the whole frame, rather than wickerwork panels between the major timbers; the whole building is then daubed, leaving no timber visible externally.

20 Walker, "Base Cruck Aisled Hall at Frobury," 58–59.

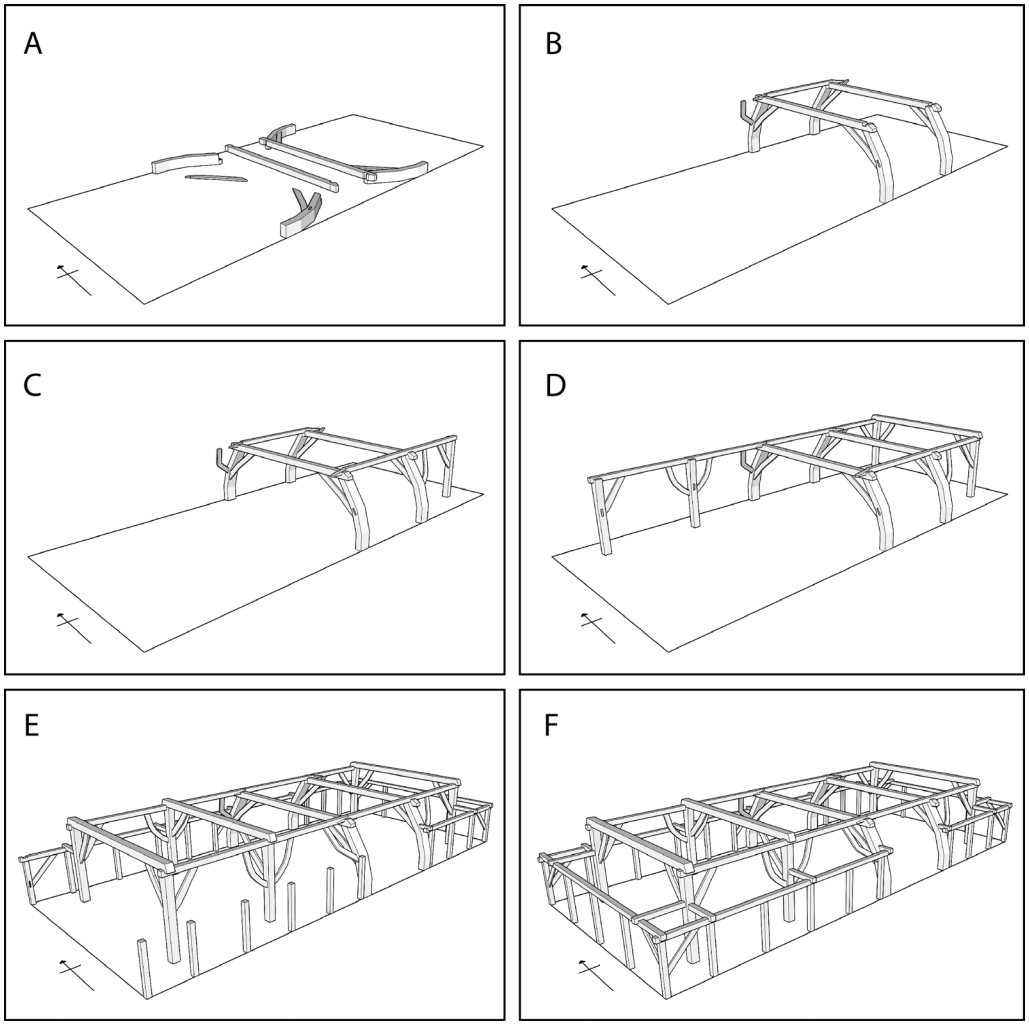

Figure 8.5. The sequence of erection of the barn at Ketsby. Diagram by authors.

porarily secured by ropes or by props to keep them upright, as Charles and Horn have suggested elsewhere.[21] When the two crucks had been raised, they were joined together by a short arcade-plate on the north side (Figure 8.5, B). The next stage was to add the south post of Truss 5 and to secure it in position using an arcade-plate, which also linked the two cruck trusses on that side (Figure 8.5, C). The north side of the truss could be completed with a further length of arcade-plate (Figure 8.5, D). The remaining aisle trusses

21 Charles and Horn, "Cruck-Built Barn of Leigh Court," 24–26, fig. 31.

could then be added towards the west and linked with the arcade-plate. The aisles were added late in the assembly process (Figure 8.5, E and F). This allowed them to have a light construction, because they were effectively supported by the rigid structure created by the crucks and arcade posts. It is uncertain whether the feet of the posts were set in the ground to hold them in position before the aisle-plate and ties were added. Alternatively, sections of the aisle wall comprising the posts and plate might have been assembled lying on the ground and then reared into position.

Timber and Timber-Working

The timber used was waney almost throughout. The timbers were not straight-grown and came from hedgerow trees (Figure 8.1). The presence of bark on timbers indicates how small the trees used were; the carpenters were very economical with their use of timber, preferring to leave sapwood and occasionally bark on the trees, rather than reduce the scantling further by removing it. Inevitably this meant that much of the timber was heavily eroded by the time the building was demolished. Some of the braces and ties were no more than small branches. In most parts of the country, timber of this type would have been considered of very inadequate quality. The timbers were converted in two ways. Flat pieces, such as the arcade braces and some of the larger timbers, were sawn. Other members were hewn with an adze or axe. Some timbers show evidence of both methods of conversion. The smallest surviving timbers, including the aisle ties and the aisle rafters, were used in the round and not squared up at all. It appears that the carpenters had a diameter in mind for each piece, and they squared off anything which was greater than this diameter, thus producing timbers which were squared heartwood at one end but complete trunks at the other. It is therefore possible to identify which "way up" many of the timbers are. The cruck timbers at Ketsby were used with the root end uppermost, although Meeson has suggested that was not common practice in England.[22] The arcade posts were also used with the butt end up. Squared wood was favoured around the scarf joints for the arcade-plate because of their critical nature. The tiebeam at Truss 1 appears to have been a little more than half a tree; the eastern face is carefully squared and prepared, while the western face at the southern end appears to have the round profile of the trunk.

22 Alcock, "Discovery of Crucks," 9. Nat Alcock has suggested to us that there is, however, limited study of this issue.

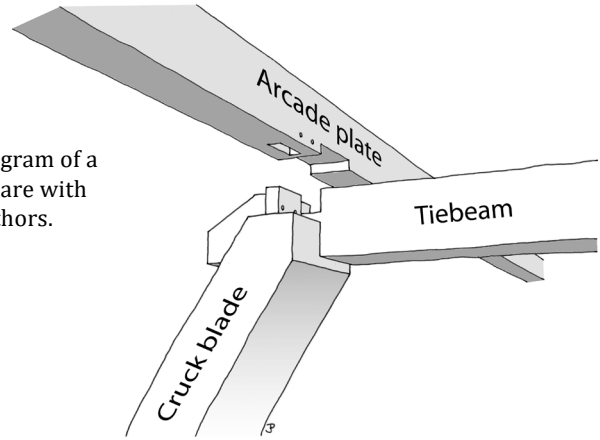

Figure 8.6. An exploded diagram of a pseudo-rotated jowl (compare with Figure 8.2). Diagram by authors.

We should not conclude from the poor quality of materials that this building was constructed on the cheap. The extraordinary economy in the use of timber at Ketsby is reflected in other, slightly later buildings recorded in Lincolnshire, and must indicate a widespread shortage of timber suitable for construction. The carpentry suggests that the builders had a clear understanding of the methods of construction for base-cruck buildings, including the use of "rotated jowls." In these joints the jowl, which typically allows a tenon to be formed to lock a beam in position, is set so that it allows the wall-plate to be similarly secured to the post or cruck blade. The term is something of a misnomer at Ketsby, where there is no jowl as such—that is, no thickening of the timber at the head to accommodate the tenon. Instead, the width of the cruck blade was used to accommodate both the joint with the beam and the tenon for the arcade-plate (Figure 8.6). Adapting terminology used by Meeson, we should properly call these "rotated pseudo-jowls."[23] Rotated jowls are usually found in conjunction with "reversed assembly," where the wall- or arcade-plate is set above the beam. The purpose of the jowl in those cases was to secure the plate to the post or blade locking the beam between the two. An alternative to using a rotated jowl was to add a second tiebeam above the first to hold the arcade plate in position.[24] That solution would not have been attractive to the carpenters at Ketsby because of the extra timber it would have required. Rotated jowls are a feature of Essex and Suffolk, where reversed assembly was employed in some bays of post-built buildings, for example at Prior's Hall, Widdington.[25]

23 Meeson, "Base Crucks," 83.

24 Meeson, "Base Crucks," 82.

25 Hewett, *English Historic Carpentry*, 275.

Conclusions

Only parts of the original fabric of the late medieval building at Ketsby survived to be recorded as it was dismantled in 1966. Nevertheless, the character of the original building is clear. The positions of the doors on either side of the barn were flanked by base-cruck trusses, constructed without braces to the arcade-plate in the entrance bay to allow access. It is very likely there was a porch to provide extra height at the entrance on the south. It was common in many larger medieval barns to form a lateral gable, allowing fully loaded carts to enter the barn.[26] The entrance at Ketsby was altogether more modest, to judge from the slight evidence present. The original lintel seems to have remained above a more recent doorframe. One tie also appears to have survived between that lintel and the arcade plate. The roof-line over most of the barn in 1966 was a continuous slope over the nave and aisles except in the entrance bay, where the slope had been reduced above the aisle to allow the formation of a higher doorway. In that way a higher entrance had been created without the need for a lateral gable.

The photographs of the barn at Ketsby provide a tantalizing record of one of the earliest known timber-framed buildings in rural Lincolnshire. That structure is key in understanding the remarkable absence of vernacular buildings here which has parallels in few other lowland English counties. The complexity of construction and the size of the building at Ketsby contrast with the very poor materials used throughout. There was probably no timber in the building which did not have waney edges, indicating that the whole scantling of the tree as far as the bark was used. For many timbers there was rather limited or even no attempt to remove the waney edges. Some timbers were simply unsquared branches. The poor quality of material employed was not simply because it was for an agricultural building. Many barns were built with timber of very good quality. Rather, it reflects the poor quality of wood in general use in many late medieval timber buildings in Lincolnshire. Even on the demesne farm good-quality timber was hard to obtain, and irregular trees grown in hedgerows had to be used. In other areas of England straight-grown timber produced from trees on managed woodlands was much more prevalent. Domesday Book suggests three areas of Lincolnshire were particularly wooded in the late eleventh century,

26 Hewett, "Tithe Barn at Siddington," fig. 1; for a more recent survey of Siddington, see Meeson, "Structural Trends in English Medieval Buildings," fig. 5; Charles, *Great Barn of Bredon*, 2–22.

one of which lay to the southeast of Louth.[27] Ketsby lay at the margin of that area, but whether the woodland had been cleared by around 1300 when the barn was built, or there was no demesne woodland at South Ormsby and Ketsby, the sources of timber to be drawn upon were clearly limited.

A second feature of note is the absence of any sill beams at Ketsby. This was clearly related to the economies in the use of timber. Generally, Lincolnshire buildings of post-medieval date dispensed with sill timbers.[28] The excavation of buildings at Goltho also uncovered structures of late thirteenth- and early fourteenth-century date where sill walls were absent and posts and studs were supported on individual padstones.[29] It is possible that there were padstones under the posts at Ketsby, but the feet of the timbers as photographed in 1966 were hidden under manure, so it is not possible to resolve that question now. The rigidity of buildings was not achieved using box-framing, as was common in southern England, but by extensive bracing to the posts and beams. This was a common structural characteristic of Lincolnshire buildings up to at least the mid-eighteenth century, and was presumably so persistent because it allowed fewer timbers to be used in construction.[30]

The Ketsby building was on a minor lay estate and clearly cannot be compared with the great, often stone-walled and mainly monastic or episcopal barns which still remain standing.[31] These buildings have attracted much attention and study, but barns on small demesnes or large peasant holdings have survived less well and have been less thoroughly investigated. The barn at Ketsby, as it stood, measured only 16.59 metres by 8.18 metres, and an end aisle to the west would have added only 1.52 metres to the length. It is more relevant to compare it with the excavated remains of a mid- to late fourteenth-century barn which accompanied a substantial farmhouse of a tenant at Caldecote (Herts).[32] That building measured 16.5 metres by

27 Darby, *Domesday Geography of Eastern England*, 59.

28 Roberts, "Persistence of Archaic Framing Techniques, Part 1"; Roberts, "Persistence of Archaic Framing Techniques, Part 2."

29 Beresford, *Medieval Clay-land Village*, 40–43; Wrathmell, "Some General Hypotheses," 180, fig. 2.

30 Pape, "Unfit for the Residence of a Minister," 11: it was initially assumed that this building was of late-medieval date; see also Miller, "Survey of a Lincolnshire Vernacular Farmhouse," 70–72.

31 For example, Charles, *Great Barn of Bredon*, 2–22; Rigold, "Some Major Kentish Timber Barns," 1–30; Stenning, "Cressing Barns," 55–107.

32 Beresford, *Caldecote*, 102–4.

5.5 metres, somewhat narrower than the Ketsby barn because it had no aisles. The barn at Ketsby also helps to explain why so few other late medieval Lincolnshire buildings survive. The quality of timber which carpenters had to employ was so poor that the buildings would have been particularly prone both to rot and structural failure. The extensive use of sapwood meant that timbers were more susceptible to decay, and the small scantling of the wood meant that when members did rot, they were likely to fail. The small number of timbers utilized also meant that any failure jeopardized the integrity of the building and could lead to collapse. The attrition rate of buildings due to decay must have been much greater in Lincolnshire than elsewhere. We may add to this the contraction in population as areas of the county were converted from arable to pasture, with a corresponding decline in rural employment. Those left were reluctant to maintain surplus buildings as holdings were engrossed and houses abandoned.[33] The Ketsby barn, through its survival until 1966, allows us to understand why so few other rural buildings of medieval date have remained standing in the area.

33 For examples in the Ketsby area, see Massingberd, *History of Ormsby-cum-Ketsby*, 246, 253.

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