

Cruck Construction: A Survey of the Problems

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THIS survey¹ has been prompted by three recent articles: Lord Raglan's 'The Cruck Truss', together with the ensuing correspondence;² James Walton's 'Hogback Tombstones and the Anglo-Danish House';³ and Iorwerth Peate's 'The Cruck Truss: a Reassessment'.⁴

It will be appropriate to begin with the problem of cruck distribution upon which the theories of origin advanced in the articles and correspondence so largely depend. Thus Raglan, arguing a 13th-century origin for the cruck technique, said: 'If it were really primitive one would expect a distribution outside Britain, and this, in spite of Erixon, has yet to be established', while Walton, deriving English and Welsh cruck construction from Scandinavia, demonstrated his conclusions with the aid of a map showing the European distribution of crucks. Peate, following Erixon, Vreim and Campbell, claims that cruck constructions exist in south Sweden, Finnmark and Lapland.

Faced with such divergent opinions the first task is to establish as firmly as possible the pattern of European distribution. Starting with north-west Germany, undoubted cruck constructions exist in the provinces of Oldenburg and Hanover, such as one from Nord-Burwinkel now in the Folk-Museum at Cloppenburg,⁵ and others from the Hummling district (FIG. 29, *a-c*).⁶ More await discovery; one has been claimed in the Eifel, for instance, of which, unfortunately, no illustration seems to have been published.⁷ In Belgium, Trefois has recorded a cruck barn at Ramskapelle in West Flanders (FIG. 29, *f*), and has plotted the location of

¹ The paper was originally read at a symposium on cruck construction held during the Caerleon meeting of the Vernacular Architecture Group, March, 1959.

² *a.* Lord Raglan, 'The cruck truss,' *Man*, LVI (1956), no. 107; *b.* Iorwerth Peate, *ibid.*, no. 167; *c.* Raglan, *Man*, LVII (1957), no. 16; *d.* James Walton, *ibid.*, no. 7, with Raglan's comments; *e.* Peate, *ibid.*, no. 57, and Raglan, *ibid.*, no. 77; *f.* D. B. Hague, *ibid.*, no. 115. Lately M. W. Barley has proposed 'a date between 1066 and the 13th century' (*Archit. Rev.*, CXXXIV, no. 797 (July, 1963), p. 7).

³ James Walton, 'Hogback tombstones and the Anglo-Danish house,' *Antiquity*, XXVIII (1954), 68-77.

⁴ Iorwerth C. Peate, 'The cruck truss: a reassessment,' *Folk-liv*, 1957-58, pp. 107-113.

⁵ Peate, *op. cit.* in note 4, pl. 2c; and information from the late Dr. Ottenjahn.

⁶ W. Lindner, *Das niedersächsische Bauernhaus in Deutschland und Holland* (1912), figs. 210, 215; *Westfalen*, XXI (1936), Heft 7, figs. 11, 12, p. 450.

⁷ J. Bendermacher, *Der Heutige Stand der Rheinischen Hausforschung* (Cologne, 1950); this pamphlet, though unillustrated, is cited by Hans Soeder, 'Formen und Gefüge älterer Hausarten in Oberitalien und in Alpenraum,' *Tagungsbericht des Arbeitskreises für deutsche Hausforschung, Traunstein/Villach*, 1956, pp. 41-125, as good evidence of cruck construction. A letter from Dr. Bendermacher suggests they are derivative types, not true crucks. Cf. J. Walton, 'Cruck trusses in the Dordogne,' *Gwerin*, V (1961), 3-6, for other cruck derivatives 'west of Cologne', and the statement (inf. from H. Hinz) that many true crucks exist in that part of Germany.

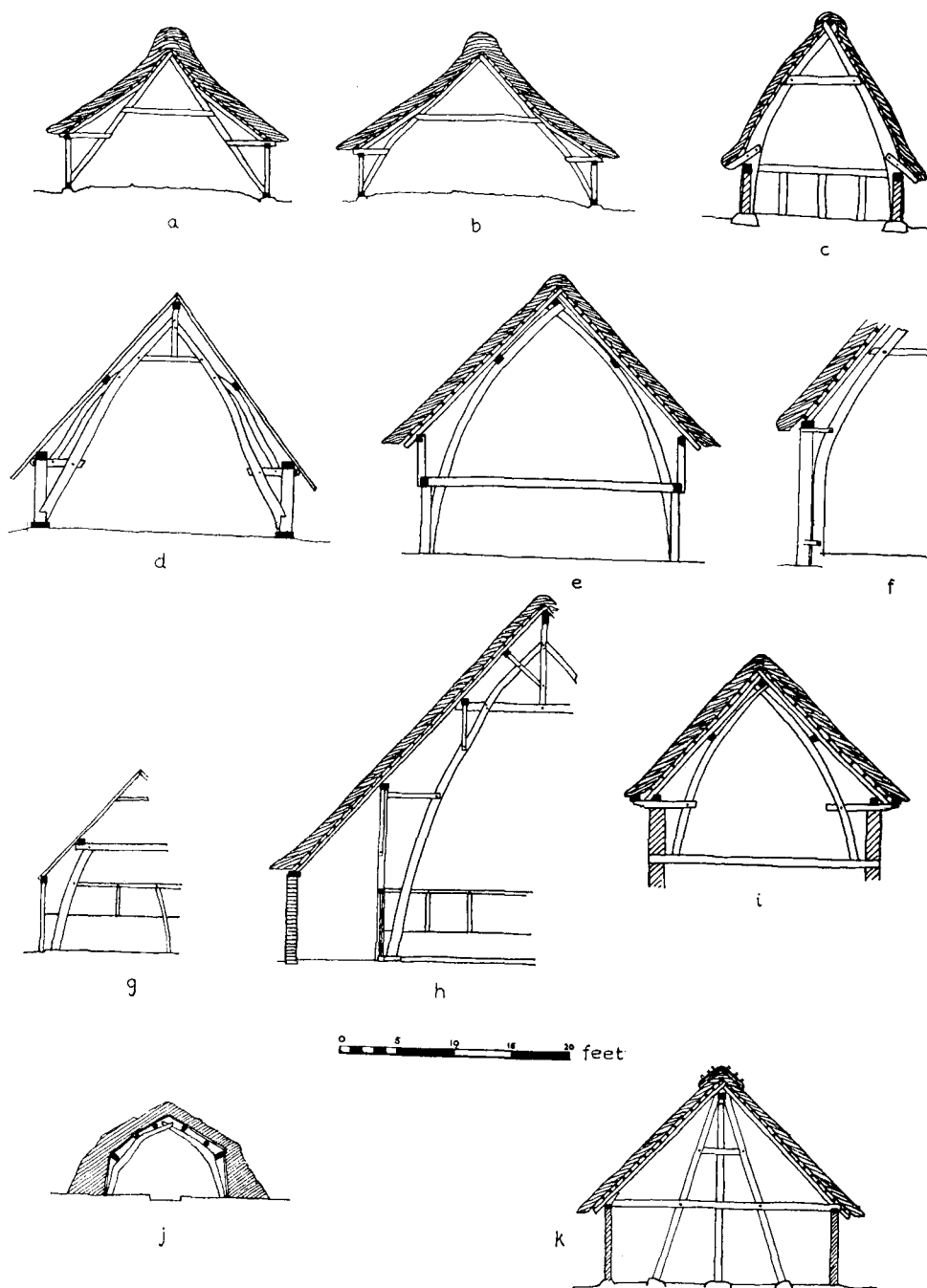


FIG. 29

EXAMPLES OF CRUCKS FROM THE CONTINENT (pp. 119, 121 f., 138 ff., 147)
a, b, Hummling district (after Lindner, *op. cit.* in note 6, fig. 215); *c*, Hummling district (after Klein, *Westfalen*, as in note 6, fig. 11); *d*, Duclair (after Trefois, 1950, *op. cit.* in note 8, fig. 66); *e*, Portovecchio (after Soeder, *op. cit.* in note 7, fig. 37); *f*, Ramskapelle (after Trefois, 1950, *op. cit.* in note 8, fig. 64); *g*, Zoetenaai-Eggerwaartskapelle (after *id.*, fig. 63, i); *h*, Westkapelle (after *id.*, fig. 63, ii); *i*, near Breia (after Soeder, *op. cit.* in note 7, fig. 31 (077A)); *j*, Finnmark (after Hinz, *op. cit.* in note 17, fig. 2); *k*, Huidbjerg (after Zangenberg, *op. cit.* in note 18, fig. 59)

some half dozen, all in the coastal regions.⁸ One other Belgian building claimed as a cruck, the well-known farm store near Audenarde illustrated by Innocent,⁹ is too lightly built to be comparable with crucks as they are generally understood. In the present state of the study of vernacular building in France we can scarcely expect crucks to have been noticed, but Trefois¹⁰ has drawn one at Duclair (FIG. 29, *d*) near the mouth of the Seine, at quite a distance from its nearest fellow in Belgium. In recent years Hans Soeder has found crucks in north Italy, notably a fine example at Portovecchio (FIG. 29, *e*) not far from Venice. Though this is the only true cruck so far published from Italy, Soeder has illustrated several derived forms from the Venezia and claims to have found the technique over the whole length of the peninsula 'from Monte Rosa to the Gulf of Taranto'.¹¹ For Spain there is nothing but Erixon's claim¹² to have discovered 'cruck-like constructions' there, and in view of his tremendous services to folk studies it would be unreasonable to complain of the inadequacy of this statement; there is reason, however, to think he might have had a different type of roof in mind. James Walton¹³ quotes Hinz for the existence of crucks in Roumania. Thus even if we exclude those countries from which no drawing or photograph of a cruck is available, i.e. Spain and Roumania, the certain distribution of crucks is very wide, and an attempt has been made to express it on a map (FIG. 40).

It remains to consider Scandinavia, where Erixon,¹⁴ Halvor Vreim¹⁵ and Ake Campbell¹⁶ have claimed that crucks exist. In Denmark, no cruck has ever been reported, nor is a single one known even from drawings or old descriptions. The best evidence put forward, that of post-holes on a few iron-age house-sites that might be explained in terms of a cruck-trussed roof,¹⁷ is too uncertain to be of any real weight. The only evidence of standing cruck-like structures is provided by those buildings called *stridsuler*¹⁸ which have the ridge-piece supported

⁸ C. V. Trefois, *Ontwikkelings Geschiednis van onze Landelijke Architectuur* (Antwerp, 1950), pp. 69-78; and by the same author, 'La technique de la construction rurale en bois,' *Folk*, 1937, pp. 55 ff.

⁹ C. F. Innocent, *The Development of English Building Construction* (1916), p. 24.

¹⁰ Trefois, 1950 (*op. cit.* in note 8), fig. 66. Some curious trusses in the Dordogne are remotely allied to cruck construction; Walton, *op. cit.* in note 7.

¹¹ Hans Soeder, *op. cit.* in note 7, esp. fig. 37.

¹² S. Erixon, 'Some primitive constructions and types of layout, with their relation to European rural building practice,' *Folk-liv*, 1937, pp. 141-2.

¹³ *Op. cit.* *d* in note 2. H. Phleps, *Ost- und Westgermanische Baukultur* (Berlin, 1934), fig. 19, 2, shows what may be a cruck. I am indebted to Mr. G. Eitzen for a photograph of this, the book itself not being available to me.

¹⁴ S. Erixon, *op. cit.* in note 12, p. 138; 'the Lapp *Kåta* skeleton has a certain equivalent in the English crucks'. It is not quite clear whether 'certain equivalent' means that the *kåta* is analogous to a cruck or is a form of cruck, but since E. concludes that the cruck-truss is 'a local West European-Scandinavian form' the latter is presumably meant.

¹⁵ H. Vreim, 'The ancient settlements in Finnmark: cabins and tents,' *Folk-liv*, 1937, pp. 169-204; and Vreim's *Norsk Trearkitektur* (1947), illustration at p. 1, reprod. by Peate, *op. cit.* in note 4. More details are needed before this structure can be said to belong to the cruck tradition.

¹⁶ Cited by Peate, *op. cit.* *b* in note 2.

¹⁷ Walton, *op. cit.* in note 3, based on S. Erixon, 'Geschichte und heutige Aufgaben der Bauernhausforschung,' in S. Funkenberg (ed.), *Haus und Hof im Nordischen Raum*, II (1937). E.'s evidence is also in *op. cit.* in note 12; cf. H. Hinz, 'Zur Rekonstruktion der eisenzeitlichen Hallen Jütlands,' *Forsch. u. Fortschr.*, xxvii (1950), 90-92, and below, p. 138.

¹⁸ Innocent, *op. cit.* in note 9, pp. 20-21; H. Zangenberg, *Danske Bøndergaard* (1925), fig. 59, reprod. by Peate, *op. cit.* in note 4.

alternately by ridge-posts and a pair of straight inclined timbers (FIG. 29, *k*)—for the latter we may adopt the useful term ‘tongs’¹⁹—and since these differ markedly from what is normally understood by a cruck they cannot be regarded as proving the existence of the cruck technique in Denmark; of this more later. Much farther north in Finnmark Vreim²⁰ has claimed that a type of cabin known as a *gamme* (FIG. 29, *j*) is a primitive form of cruck; primitive in the sense of being crude,²¹ for the timbers are trimmed birch poles, either bent or naturally curved, used to build small and slight structures. They are too far removed from true crucks to be classed with them, and are in any case temporary structures; it is significant that no Norwegian or Swedish permanent buildings show anything like a cruck technique. How we classify the Finnmark cabins will depend on the theoretical relationship we postulate between such simple modern survivals and the highly sophisticated works of medieval carpentry found in England and Wales, nor is it necessary to assume that the latter developed from the distant precursors of the former. I prefer, therefore, to leave them out of the argument for the present.

Even so, a distribution embracing Oldenburg, Venice and Duclair is very wide (FIG. 40), and since the two last-named places are only included from publications of the last decade we may reasonably expect the density and range of distribution to grow with greater awareness of the problem. Hence there is a *prima facie* possibility that the cruck technique is of great antiquity, although Raglan, confronted with the European evidence,²² declared that ‘crucks on the continent may have had the same origin’ as that he proposed for the English ones, namely the imitation of the Gothic arch. Applied to north-west Germany and Italy, where Gothic architecture developed late, this explanation is open to grave doubt, not to mention Roumania where it could not be seriously entertained. Again, on purely distributional grounds Walton’s theory of an origin in ‘that part of Schleswig north or east of Angeln’, where ‘in the 5th century must have lived tribes who retained the cruck truss after it had been abandoned in adjoining areas’,²³ is inadequate, besides being an inherently unhistorical explanation. Taking a somewhat wider view it might be possible to regard crucks as a Germanic invention distributed throughout Europe in the age of the migrations. This at a stretch might account for all western Europe, but not Roumania, so Hinz enlarges the migration theory to include late medieval colonization and concludes that 13th-century German settlers took the technique with them into that country.²⁴ It is unfortunate for the ‘Germanic’ theorists that the British evidence to which we now turn is decisively against them.

The existing maps of English and Welsh crucks compiled by Innocent and Walton have the unsatisfactory convention of hatching by counties. I have tried

¹⁹ Perhaps first used by Erixon, *op. cit.* in note 12.

²⁰ *Op. cit.*, 1937, in note 15.

²¹ Cf. Lord Raglan on the word ‘primitive’, *J. Roy. Anthropol. Inst.*, LXXXVII (1957), 140.

²² *Op. cit.* *d* in note 2.

²³ *Op. cit.* in note 3, p. 76.

²⁴ Cited by Walton, *op. cit.* *d* in note 2.

to provide a more satisfactory map (FIG. 30)²⁵ by searching published material and the files of the National Monuments Record²⁶ and by correspondence,²⁷ plotting the information so gained in the way customary among prehistorians, by using a dot for each example. The first question, whether the resulting map merely reflects the intensity of field-work in various parts of the country, may be answered in the negative, provided we regard only the overall pattern and for the time being pay no attention to the relative densities of distribution within cruck territory. The map may be compared with another (FIG. 31) showing the field-work accomplished in relevant parts of England and Wales. There is a remarkable contrast between Leicestershire, where crucks have been found in considerable numbers mainly through the systematic work of V. R. Webster,²⁸ and the neighbouring county of Huntingdon, where not one was discovered by the Royal Commission on Historical Monuments during its survey in 1926. Nor can the difference be ascribed to official ignorance; several crucks were noted by the Commission in its early Buckinghamshire survey of 1912-13, whereas none was found in the succeeding and much more thorough survey of Essex between 1914 and 1924.²⁹ Again, Leicestershire's eastern neighbour Lincolnshire appears to be quite devoid of crucks despite extensive work by M. W. Barley.³⁰ As for Kent and Sussex, the long tradition of amateur research into timber buildings in both counties has not produced a single cruck. Moreover, even if a few cruck buildings should turn up in the eastern and south-eastern counties, there can never be enough to upset the general pattern of western and midland distribution; research has gone too far for that to happen. A further point, suggested by the many crucks in the industrialized districts of south Yorkshire and their complete absence in the eastern counties, is that some concentrations of crucks occur in districts where one would expect the highest rate of destruction, hence the distributional pattern is not likely to be fortuitous. So I conclude that the map is reliable, and incidentally it is based on far more examples than many of its kind—about 450. The easternmost one so far claimed is in Suffolk, put forward by Walton in 1948;³¹ R. W. McDowall, who examined it, declared it no true cruck. The most easterly example yet known is now a possible cruck at Shudy Camps, Cambridgeshire, which is not marked on the map.³²

Broadly speaking this map coincides with Walton's save for some extension

²⁵ First published in 'Medieval roofs: a classification', *Archaeol. J.*, cxv (1958), 139, fig. 16.

²⁶ Photographs are a more reliable source of evidence for crucks than for most features of building construction, for two reasons: crucks are difficult to conceal completely in a later rebuilding, and they have a curiosity value which causes them to be recorded by people not otherwise interested in vernacular building.

²⁷ The further examples collected since the map was compiled are all in west or north-west England and do not alter the distributional pattern at all.

²⁸ V. R. Webster, 'Cruck-framed buildings of Leicestershire,' *Trans. Leics. Archaeol. Soc.*, xxx (1954), 26-58.

²⁹ R. Comm. Hist. Mon., *Bucks.*, 2 vols., 1912-13, esp. vol. II, illus. opp. p. 224; R. Comm. Hist. Mon., *Essex*, 4 vols., 1916-23.

³⁰ Personal communications.

³¹ J. Walton, 'The development of the cruck framework,' *Antiquity*, xxii (1948), 179-189.

³² Inf. from Dr. P. M. G. Eden, who discovered it in the course of the R.C.H.M. survey of Cambridgeshire.

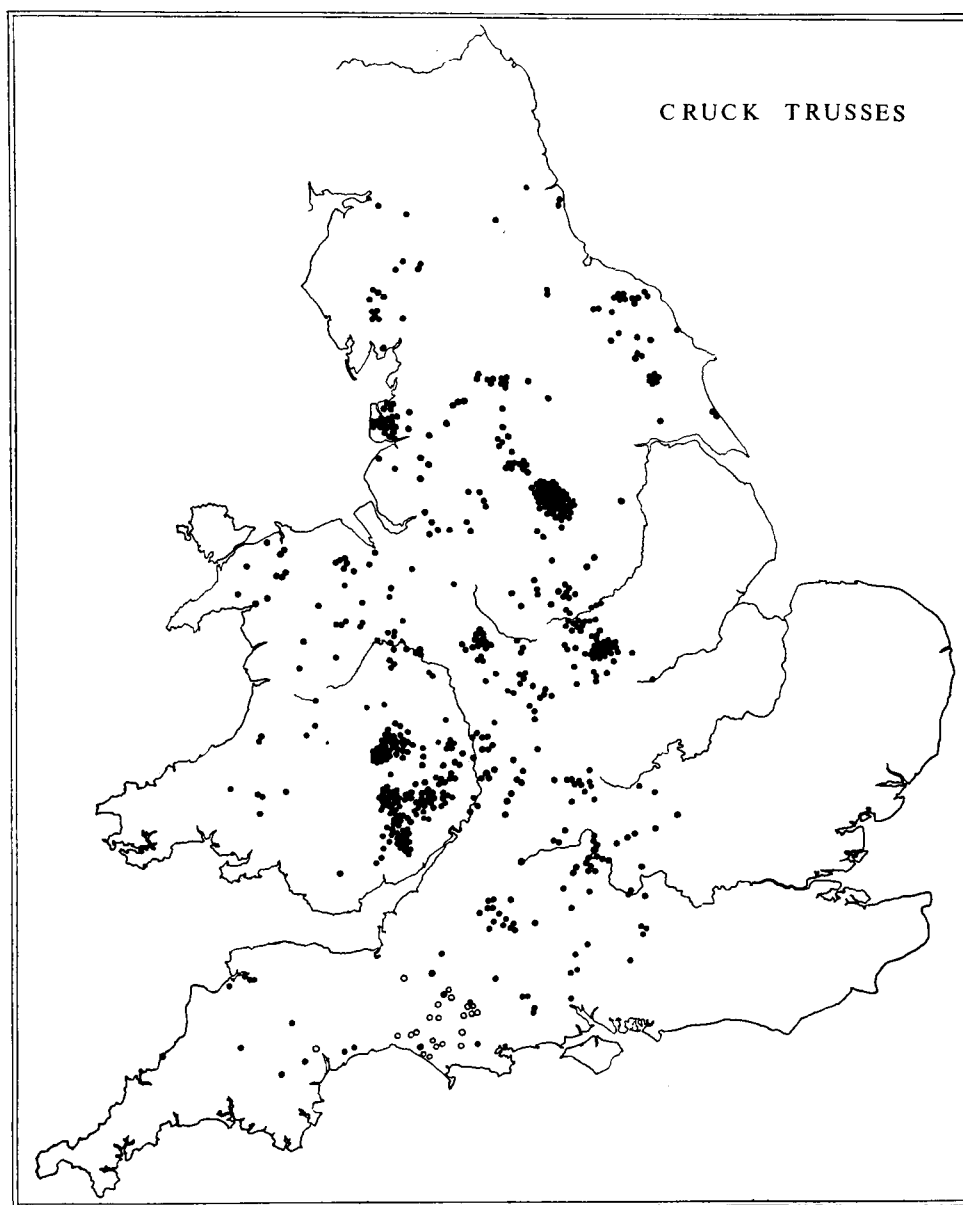


FIG. 30

DISTRIBUTION-MAP OF CRUCKS IN ENGLAND AND WALES (pp. 123, 125 f.)

(After *Archaeol. J.*, cxv (1958), fig. 16, by courtesy)

in the south-west. That the distribution has some Celtic flavour is clear from the spread over Wales and south-west England, to which the recent discoveries of Scottish and Irish crucks add emphasis.³³ The point is underlined by comparison

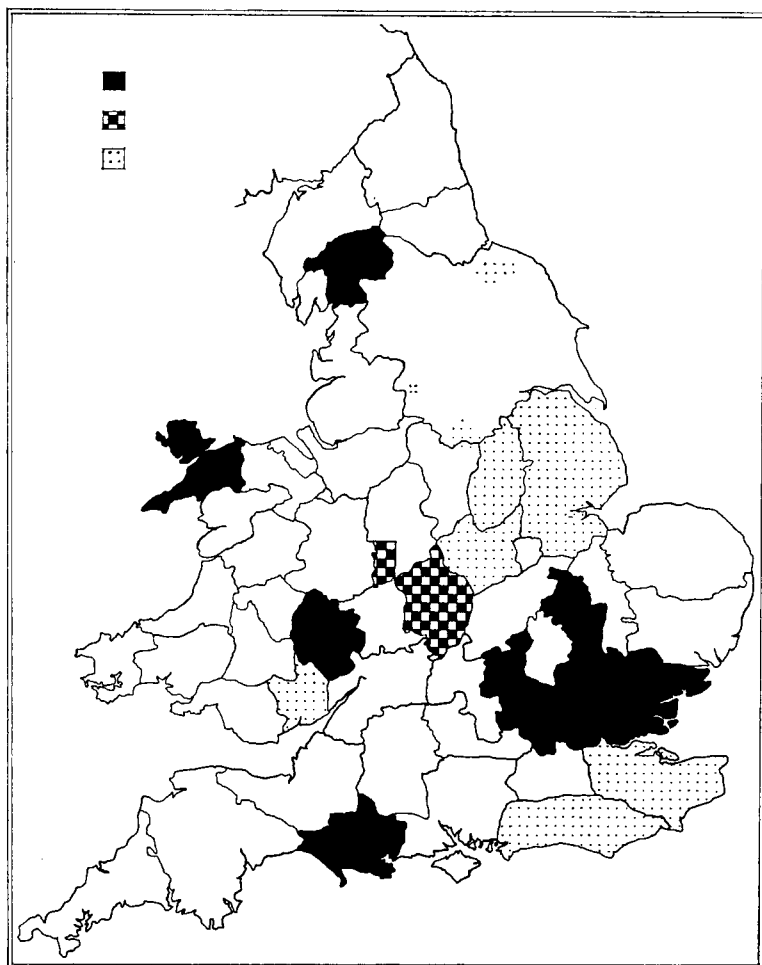


FIG. 31

MAP SHOWING PROGRESS OF SURVEYS OF VERNACULAR BUILDING, TO 1959, IN ENGLAND AND WALES (p. 123)

Counties surveyed by Royal Commissions on Ancient and Historical Monuments are blackened; areas recently surveyed by Victoria County Histories are chequered; those where considerable field-work has been done by private individuals are stippled

with a map compiled by Wooldridge to show three distinct areas; the Celtic west, the areas of early English settlement in the east, and between them a transi-

³³ J. G. Dunbar, 'Some cruck-framed buildings in the Aberfeldy district . . .', *Proc. Soc. Antiq. Scot.*, xc (1956-7), 81-82. James Walton, 'Cruck-trussed buildings in Scotland,' *Gwerin*, I (1957), 109-122. For Irish crucks, D. McCourt, 'Cruck trusses in north-west Ireland,' *Gwerin*, III (1961), 165-85, and A. Gailey, 'Two cruck houses near Lurgan,' *Ulster Folk-Life*, VIII (1962), 57-63.

tional zone . . . in which 'an appreciable Celtic population lingered'.³⁴ Now the area of appreciable Celtic population, together with the Celtic west, coincides fairly closely with the area in which crucks are found. Comparison may also be made with A. H. Smith's more recent map published by the English Place-Name Society,³⁵ a map which is particularly relevant to the present purpose because it shows all known British names and was not constructed to illustrate a particular phase of historical development (FIG. 32). Allowing for the different conditions governing the survival of place-names and cruck-trussed buildings, the two maps are remarkably similar, nor is it at all surprising that Cornwall, an area of poor material culture that was the last of the Anglo-Saxon conquests, should show many Celtic place-names but so far only one cruck. Whatever may be thought of this correspondence, it is quite incredible that any aspect of Anglo-Saxon material culture could at any period have penetrated Wales and the western half of England thoroughly, while leaving so little trace in the eastern counties as to make the pattern of survival of material culture the complement of the pattern of early and densest settlement. This I hold to be self-evident and accordingly dismiss any theory of Germanic origins.

Before going further it may be well to set forth the main factors which govern the distribution of different forms of roof structure. The first consideration is that carpentry was a craft technique, a technique, that is to say, which was handed down from master to apprentice by demonstration, without formal instruction. Since the carpenter's products are not portable, the presence of a new kind of structure in any given place argues the arrival of a carpenter trained in the areas where that structural form had been developed. It is this which explains both the slow spread of new building techniques, and their coherent distributions in the middle ages and earlier.³⁶ Moreover I think it might be generally conceded that craftsmen tend to be conservative in their technical outlook, though it is hard to adduce specific evidence to support this statement. The origin of this conservatism is partly economic—the desire to restrict competition—but in part it results from a lack of standards of comparison; only the exceptional medieval carpenter could have travelled enough to see timber-working techniques unlike those he was familiar with, and not until practical manuals of instruction began to be published in the late 18th century could knowledge be gained vicariously. Moreover, to learn a new structural principle required practical training for a carpenter and his assistant, training which in the nature of things would rarely if ever be acquired. Hence the stimuli to the improvement of craft techniques were mainly and perhaps solely the changing requirements of society, an obvious example being the demand for an aisleless in place of an aisled hall.³⁷

³⁴ S. W. Wooldridge, 'The Anglo-Saxon settlement,' in H. C. Darby, *An Historical Geography of England* (1948), pp. 88–132, and map, fig. 17.

³⁵ A. H. Smith, *English Place-Name Elements* (1956), pt. 1.

³⁶ It is difficult to compare the mode of distribution of building techniques, which find expression in non-portable structures, with those of other craft techniques whose products are all, or nearly all, portable and can therefore be transported by trade. Nevertheless with certain safeguards pottery shapes might be used to show how new ideas were transmitted by the migration of craftsmen. Some brief remarks about pottery by G. C. Dunning are interesting in this connexion: 'Trade relations between England and the continent in the late Anglo-Saxon period,' D. B. Harden (ed.), *Dark-age Britain* (1956), p. 231.

³⁷ J. T. Smith, 'Medieval aisled halls and their derivatives,' *Archaeol. J.*, cxii (1955), 76 ff.

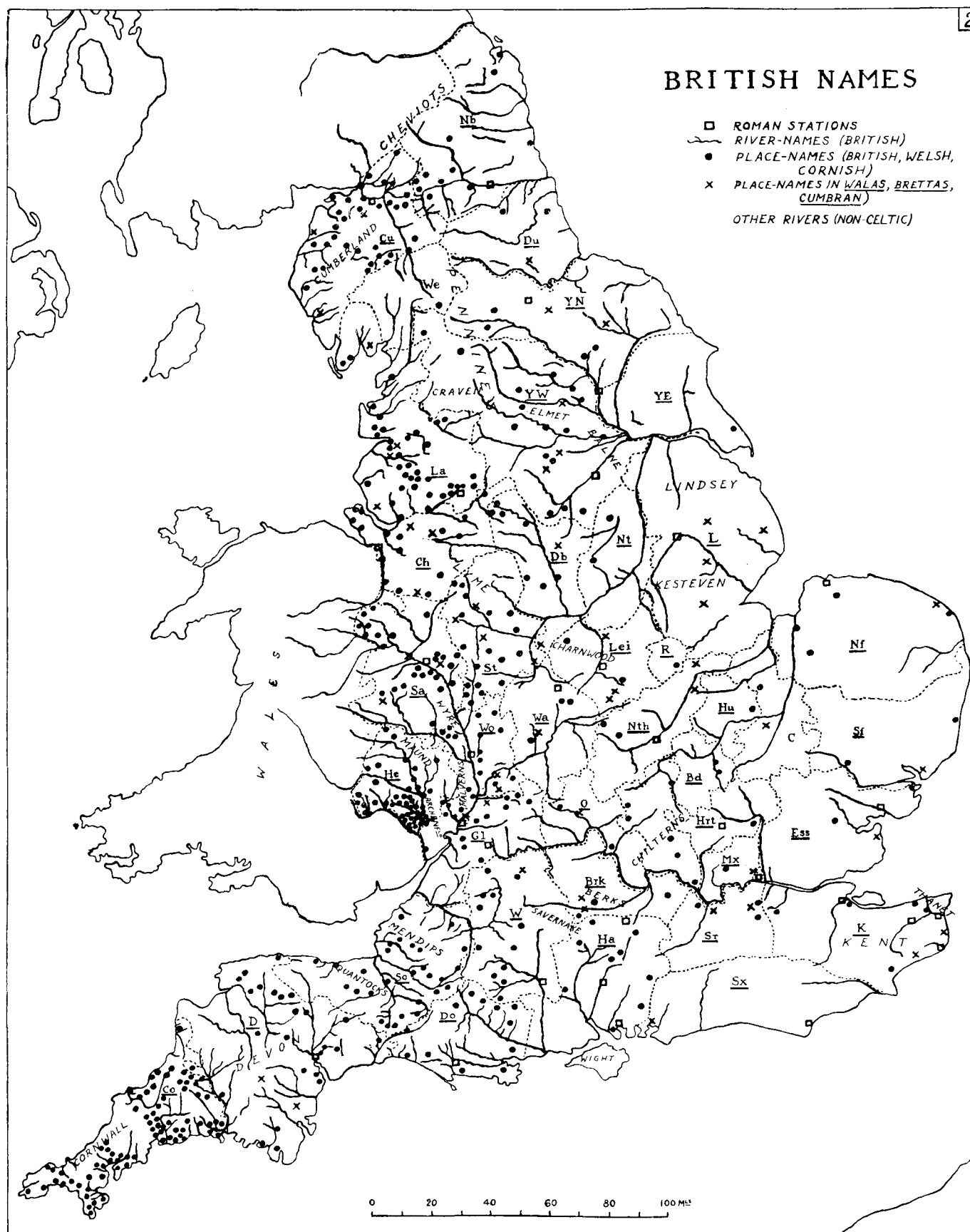


FIG. 32
 MAP OF BRITISH PLACE-NAMES (p. 126)
 (After A. H. Smith, *op. cit.* in note 35, map 2, by courtesy)

But for an insular society this has a corollary which may be most easily exemplified from the 11th, 12th and 13th centuries. The Norman conquest established virtually identical societies on both sides of the English Channel, at least as far as the ruling groups were concerned; soon, however, the differing pace of economic and social development in England and Normandy led to different demands being made of craftsmen in the two countries. After the lapse of two and a half centuries, it seems clear that English and Norman carpenters had developed different aspects of their common heritage to such an extent that radically different technical solutions were being adopted for the same fundamental problems.³⁸ From this it follows that technical ideas were no longer readily interchangeable without the movement of numbers of men, even had it occurred to anyone to introduce new structural ideas deliberately; but social differences virtually preclude such a desire.³⁹ If the foregoing remarks are correct they imply that we need only expect to find foreign influences on English carpentry traditions where there was an influx of craftsmen. This means that at all periods prior to the Renaissance such an influx will only accompany movements of peoples.

Having already established the distribution of crucks in England and Wales let us now consider in what historical context it will fit, bearing always in mind that it is a craft product. It will not fit an Anglo-Saxon or a Norman context, since the densest distribution would in each case have to be eastward; moreover there is no later cultural penetration to explain the total supersession of crucks in those areas most thoroughly normanized. Were the origin Scandinavian, crucks would be known in those home lands, if only in late derived forms, and the English distribution pattern would be different. Hence by elimination the conformity of the cruck pattern with that of Celtic place-names may provide the answer: that both are fundamentally due to Celtic peoples. That is not necessarily to say that only Celts built crucks; it merely assigns their origin at some distant period in the British Isles to those peoples. Sir Cyril Fox and Lord Raglan have hinted at a prehistoric origin of the cruck,⁴⁰ a supposition which could certainly include the Celtic peoples of these islands. No cruck construction has been recognized by excavation in Britain, so we must turn again to distributional techniques in order to test the hypothesis.

First of all it will be necessary to examine the distribution of other major categories of roof, to see how they accord with the concepts that were implied in the preceding remarks and are largely derived from Sir Cyril Fox's *Personality of Britain*. If the underlying notion is correct, later cultures will have produced equally distinct and recognizable patterns, the most important of which I have

³⁸ Cf. English roofs in Smith, *op. cit.* in note 25 and sources there cited, with roofs in northern France (for Normandy there is no separate publication), illustrated either in *Charpentes*, published by Centre de Recherches sur les Monuments Historiques (Min. de l'Éduc. Nat.), n.d. (c. 1959), 7 vols., or the articles it is based on; H. Deneux, 'L'évolution des charpentes . . .', *L'Architecte* (1927).

³⁹ Thus England seems to have retained the type of hall open to the roof for longer than France, and certainly the open hearth persisted long after it had been abandoned by French feudal lords. Hence Frenchmen used techniques of roofing that could not be introduced into England simply because they would have been deemed inappropriate; cf. the remarks of Prof. Cippola, quoted below, p. 149.

⁴⁰ Fox and Raglan, *Monmouthshire Houses*, I, 74; 'a technique which may go back a thousand years or more' from c. 1550.

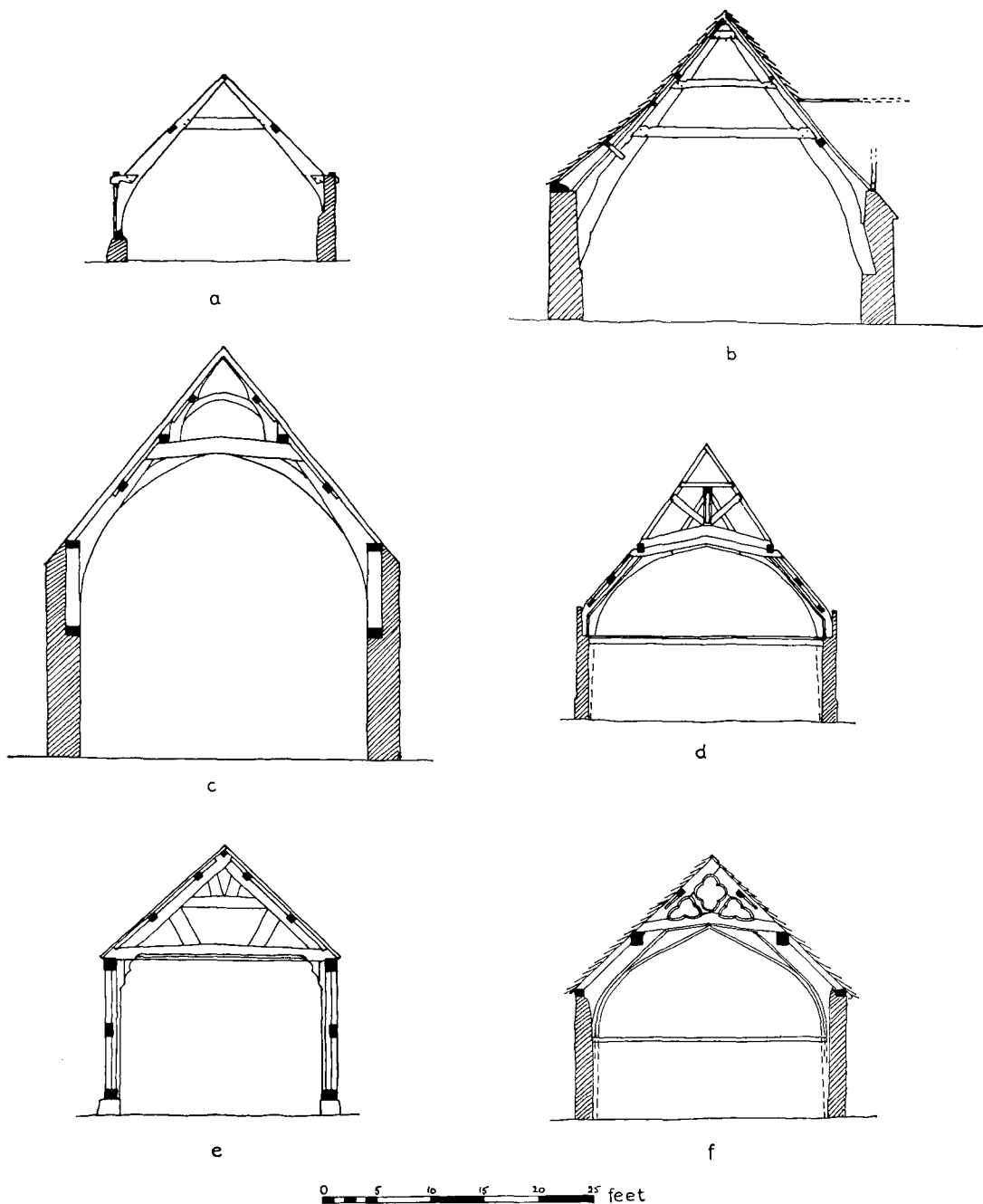


FIG. 33

EXAMPLES OF BRITISH CRUCKS (pp. 129, 141 f., 145)

a, Pwll, Tregare, Mon. (after Fox and Raglan, *op. cit.* in note 40, I, 29); *b*, Church Enstone, Oxon. (after R. B. Wood-Jones, *Oxoniensia*, XXI (1956), fig. 15); *c*, Glastonbury (after drawing in Nat. Monuments Record); *d*, Cubbington, Warws. (after drawing by S. R. Jones); *e*, Chapel Farm, Wigmore (after R. C. H. M., *Herefords.*, III, 209); *f*, Amberley Court, Marden (after *id.*, II, 138)

discussed elsewhere, with maps.⁴¹ The first relevant map is of medieval aisled halls with roofs of trussed-rafter type, roofs that have neither ridge-piece nor principals. These halls, nearly all of which were built prior to 1350 and which are confined to south-east England, represent, broadly speaking, the widest effective penetration of Norman material culture. Unfortunately no map showing the distribution of any other aspect of Norman material culture seems to be available for comparison, nor have the Norman elements of English place-names been mapped. Nevertheless the lowland spread of these aisled halls is the converse of the cruck pattern and the distributional relationship is what would be expected from the historical relation of the two societies.

In the same article it was suggested that medieval English roofs are best understood in terms of a few pure types and an endless variety of hybrid forms. One of the most remarkable classes of these hybrids results from the union of crucks and trussed-rafter construction in order to achieve a wide span and so dispense with the posts entailed by the aisled plan. This solution involved building a roof in two tiers. In the lower, called a base-cruck,⁴² two blades resembling those of a true cruck-truss rose, not to an apex but to a collar, into which they were tenoned; that part of the roof above the collar was virtually an independent structure. Leicester Guildhall, built *c.* 1350–60, is a good example;⁴³ above its base-crucks is a crown-post roof in the normal manner of south-eastern England. The base-cruck at Cubbington manor house, Warwickshire⁴⁴ (FIG. 33, *d*), supports a different form of upper roof which also belongs to the same family of roofs without ridge-pieces, and is basically a trussed-rafter type. Recently several roofs of the same type have been discovered in Sussex,⁴⁵ some of which can be ascribed to the late 13th century (FIG. 39, *b*). If the assumption that the base-cruck is derived from the true cruck is correct, these suggest that the origin of cruck construction must be sought well before the middle of the 13th century.

There is, however, a different type in which the base-cruck is combined with an upper-cruck forming what may be called a two-tier cruck (FIG. 33, *c*). Such roofs, bridging a wide span entirely out of the resources of the cruck tradition, represent its crowning achievement. The famous tithe-barns at Bradford-on-Avon and Glastonbury⁴⁶ are probably the most familiar specimens of a little-known class of structure. Bewley Court at Lacock and Butleigh Court⁴⁷ are two splendid domestic examples.

Now if we plot all the known base-crucks and two-tier crucks the following

⁴¹ *Op. cit.* in note 25, figs. 14, 15.

⁴² *Ibid.*, p. 140.

⁴³ *Ibid.*, pl. xviii B.

⁴⁴ Recorded by John West; it is hoped to publish the house in *Trans. Birmingham Archaeol. Soc.* Cf. also West Bromwich manor house, as note 25, fig. 17.

⁴⁵ Tickerage, West Hoathly, was the first to be published; R. T. Mason, 'Fourteenth-century halls in Sussex,' *Sussex Archaeol. Coll.*, xcv (1957), 83. Cf. R. T. Mason, *Framed Buildings of the Weald* (1964), p. 23, for an up-to-date map of base-crucks.

⁴⁶ Bradford-on-Avon: Ministry of Works leaflet.

Glastonbury: photo copies of measured drawings by P. K. Pope, 1931, in Nat. Monuments Record.

⁴⁷ H. Brakspear, 'Bewley Court, Lacock,' *Wilt. Archaeol. Mag.*, xxxvii (1911–2), 391–9.

Butleigh Court: Buckler drawing, B.M. Add. Ms. 36436, f. 394.

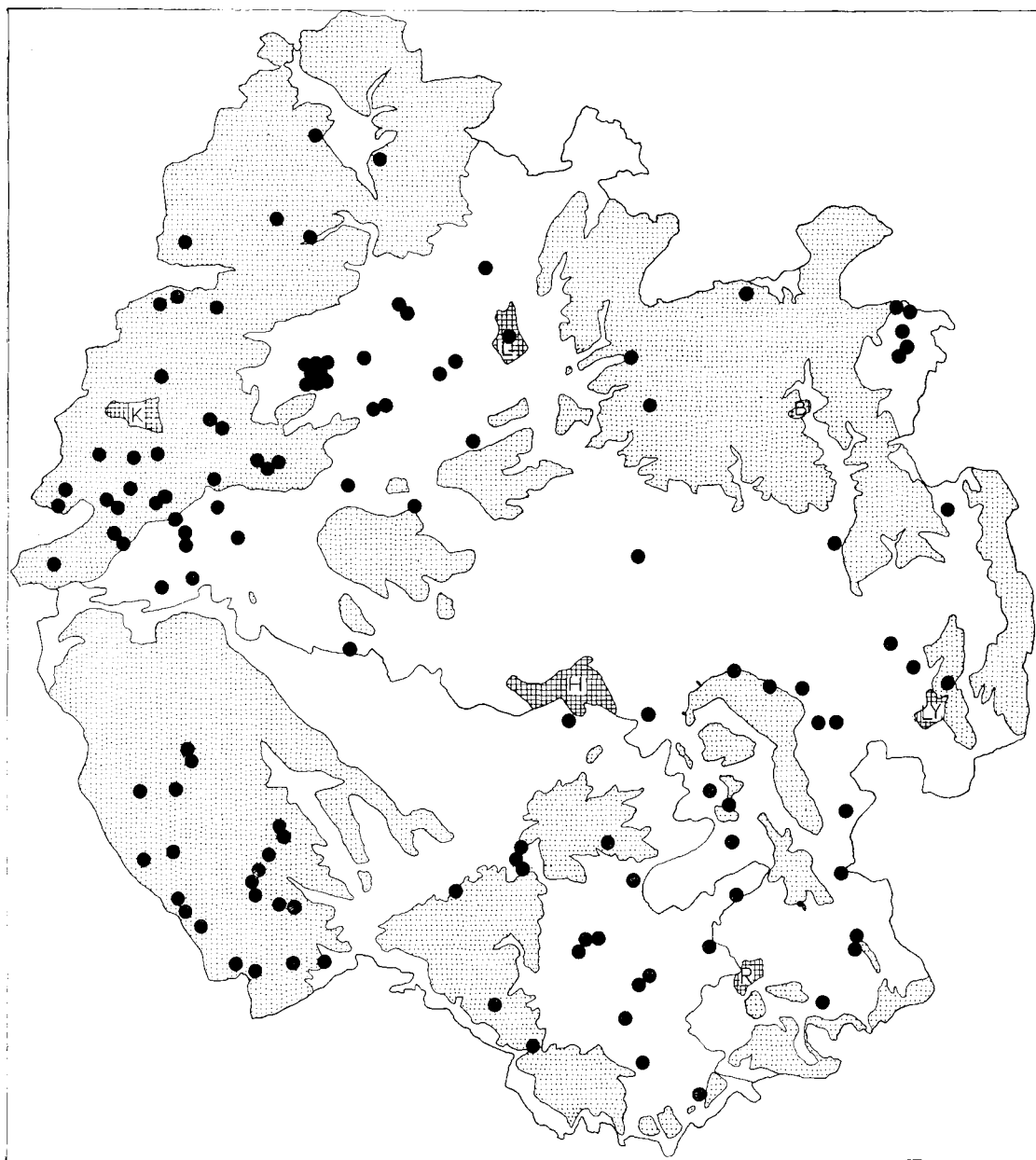


FIG. 34

DISTRIBUTION-MAP OF CRUCKS IN HEREFORDSHIRE (p. 133 f.)

Black circles mark cruck-trusses. Land over 400 ft. is stippled. B = Bromyard, H = Hereford, K = Kington,
 L = Leominster, LY = Ledbury, R = Ross-on-Wye

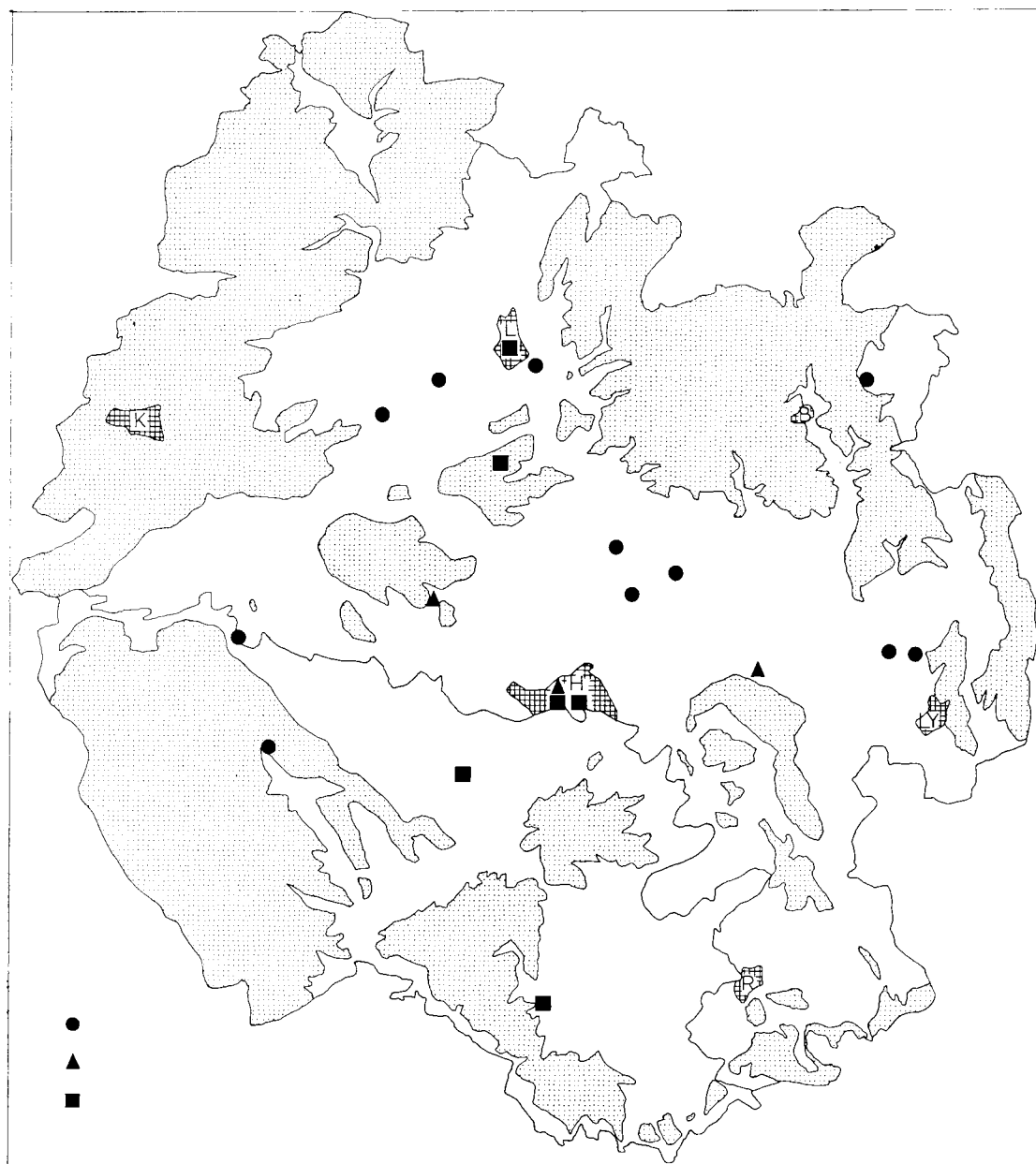


FIG. 35

DISTRIBUTION-MAP OF TRUSSED-RAFTER AND ALLIED ROOFS IN HEREFORDSHIRE
(p. 133 f.)

Black circles mark spere-trusses; triangles, crown-posts; squares, hammer-beams. Land over 400 ft. is stippled. For key to letters see FIG. 34

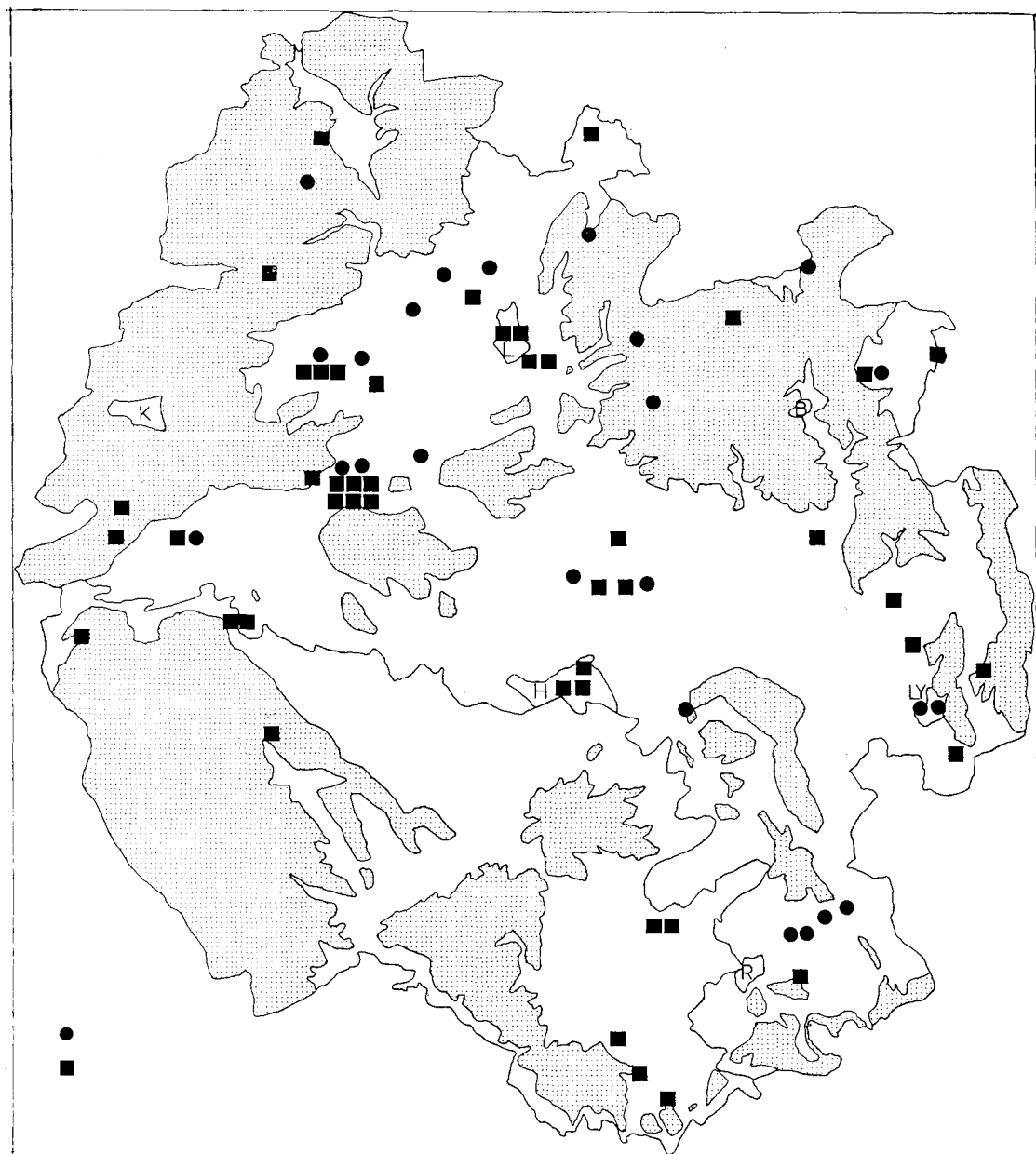


FIG. 36

DISTRIBUTION-MAP OF PRINCIPAL-RAFTER ROOFS IN HEREFORDSHIRE (p. 145)
 Black circles mark collar-beam roofs; squares, tie-beam roofs. Land over 400 ft. is stippled. For key to letters see FIG. 34

result emerges; the base-crucks are thinly but fairly widely distributed over the midland part of the cruck zone, whereas the two-tier crucks are localized in Wiltshire, Somerset and Dorset. Applying the Celtic hypothesis to such roofs we find that the two-tier crucks, the finest manifestation of the unaided cruck tradition, occur mainly in those parts of the kingdom of Wessex acquired during the second phase of its expansion. This is just the area where there is the strongest evidence of survival of a native population under Anglo-Saxon lordship, where, that is to say, the Celtic element remained strong; as J. N. L. Myres put it: 'In Wessex . . . clearer evidence is preserved of native persistence than in any other part of England.'⁴⁸ And as Kenneth Jackson says: 'They must certainly have been speaking Brittonic'—the P-Celtic language brought by the iron-age tribes—'in Somerset and Dorset by the end of the 7th century [A.D.]'.⁴⁹ Given a Celtic origin for British crucks, this is precisely the area where the survival of Celtic craftsmen and their traditions might be expected to produce the finest examples. So far, then, one possible and consistent interpretation of the evidence is of a technique brought by Celts and spreading gradually throughout the whole of England and Wales (the only areas for which we have adequate evidence) but which, in south-eastern England, was superseded successively in the Roman, Anglo-Saxon and Norman periods, so that in that area the technique yielded entirely to others of later continental inspiration, using trussed rafters without a ridge-piece.

Since other writers take a radically different view of the same evidence a test may be suggested for any proposed solution; does it explain how the various types of roof structure attained their present distributions?

I have tried to apply the hypothesis on a local scale in Herefordshire, this being almost the only county suitable for the purpose, where the opposed techniques mingle and for which a full survey is available.⁵⁰ The distribution of cruck buildings (FIG. 34) of whatever date is extremely interesting. It has a western weighting with heavy concentrations on the eastern fringes of the Black Mountains and the Radnorshire hill-country. The only town with many crucks is the small and very rural borough of Pembridge; Kington also suggests itself as a centre perpetuating the cruck tradition, but if so it either has been largely rebuilt or was inadequately investigated. Leominster has one cruck building; the other towns, Hereford, Ledbury, Ross and Bromyard, none. The distribution is peripheral, heaviest to the west, but having as its clearest characteristic the avoidance of the central plain in the neighbourhood of Hereford itself. Earlier I postulated a trussed-rafter tradition developing in SE. England and spreading north and west to supplant crucks. A map of the not very numerous Herefordshire roofs of this class (FIG. 35) shows a distribution pattern the converse of the first one. To the roofs proper is added the spere-truss, since it has the same

⁴⁸ R. G. Collingwood and J. N. L. Myres, *Roman Britain and the Anglo-Saxon Settlements* (2 ed., 1937), p. 446.

⁴⁹ K. Jackson, *Language and History in Early Britain* (1953), p. 239.

⁵⁰ R. Comm. Hist. Mon., *Herefordshire*, 3 vols., 1931-34. The topography of Westmorland renders the R.C.H.M. survey almost useless for this purpose since all distributions look very much the same unless they are plotted on a large-scale map.

lowland and south-eastern origins.⁵¹ Though there are not very many roofs in this class, the three in Hereford and two in Lcominster suggest, by comparison with the cruck map, that the towns were the centres of technological progress, whence new methods of carpentry were disseminated. Fox and Raglan assume that this was the case, which, indeed, is what would be expected on other grounds.⁵² S. R. Jones and I hope we have demonstrated the point specifically in connexion with the Wealden house.⁵³

So much for the distributions; several different patterns lead to a consistent body of conclusions without providing proof of the theory in which the conclusions are embodied.

The next step is to examine the evidence provided by excavation. There are two sites in question, both in Germany. The first and better known, at Westick near Kamen (Kreis Unna) not very far from Hamm in the Ruhr, was excavated in 1935. In the southern area of two that were dug a very complicated system of post-holes was interpreted as a hall house (FIG. 37). G. Bersu recently reinterpreted the plan⁵⁴ as a house that had been twice rebuilt, first adjacent to and west of its original site and subsequently upon it, so that the area containing the two sets of post-holes has become unintelligibly complex. It should be added that Bersu appears to reject the interpretation offered by the excavator and accepted below. Occupation began in the late 3rd century A.D. and lasted to the end of the 4th or the beginning of the 5th century. The most remarkable thing about the ground plan of the hall is that there are in effect two rows of post-holes close together along each of the long walls, the inner row much less numerous than the outer. This is more clearly seen on the north side but is discernible on the south too. There are traces of an irregular line of centre posts, which I shall call ridge-posts since they were presumably intended to carry a ridge-piece. At several points two post-holes are associated, one aligned with the outer wall, the other immediately inside it. The sections cut through three pairs of these post-holes, two on the south and one on the north side, showed that in each the inner post-hole was intended for a timber leaning inwards, the outer for a vertical post.⁵⁵ Unfortunately the excavator, A. Stieren, was denied the discovery of all the opposed pairs of such post-holes that the plan suggests as the original arrangement. Stieren and Klein, attempting a reconstruction of the hall, decided it was an early example of cruck construction, and their conclusion is reinforced by one general point; so far as is known, the cruck is the only type of roof support which, in its earlier forms, is placed immediately inside timber walls. As Sir Cyril Fox and Lord Raglan rightly observed in *Monmouthshire Houses* the examples in that county mostly show an integration of roof and wall structure that marks the very

⁵¹ Smith, *op. cit.* in note 37.

⁵² *Op. cit.* in note 40, I, 38, and more explicitly, II, 87 and III, 88.

⁵³ S. R. Jones and J. T. Smith, 'Wealden houses in Warwickshire and their significance,' *Trans. Birmingham Archaeol. Soc.*, LXXIX (1964), 24-35.

⁵⁴ L. Bänfer, A. Stieren, A. Klein, 'Eine germanische Siedlung in Westick bei Kamen, Kr. Unna, Westf.,' *Westfalen*, as in note 6, pp. 410-453. Bersu's comments were made in his Albert Reckitt Memorial Lecture to the British Academy, 1959, and have recently found support from M. W. Barley, *op. cit.* in note 2.

⁵⁵ L. Bänfer, *op. cit.* in note 54, fig. 3.

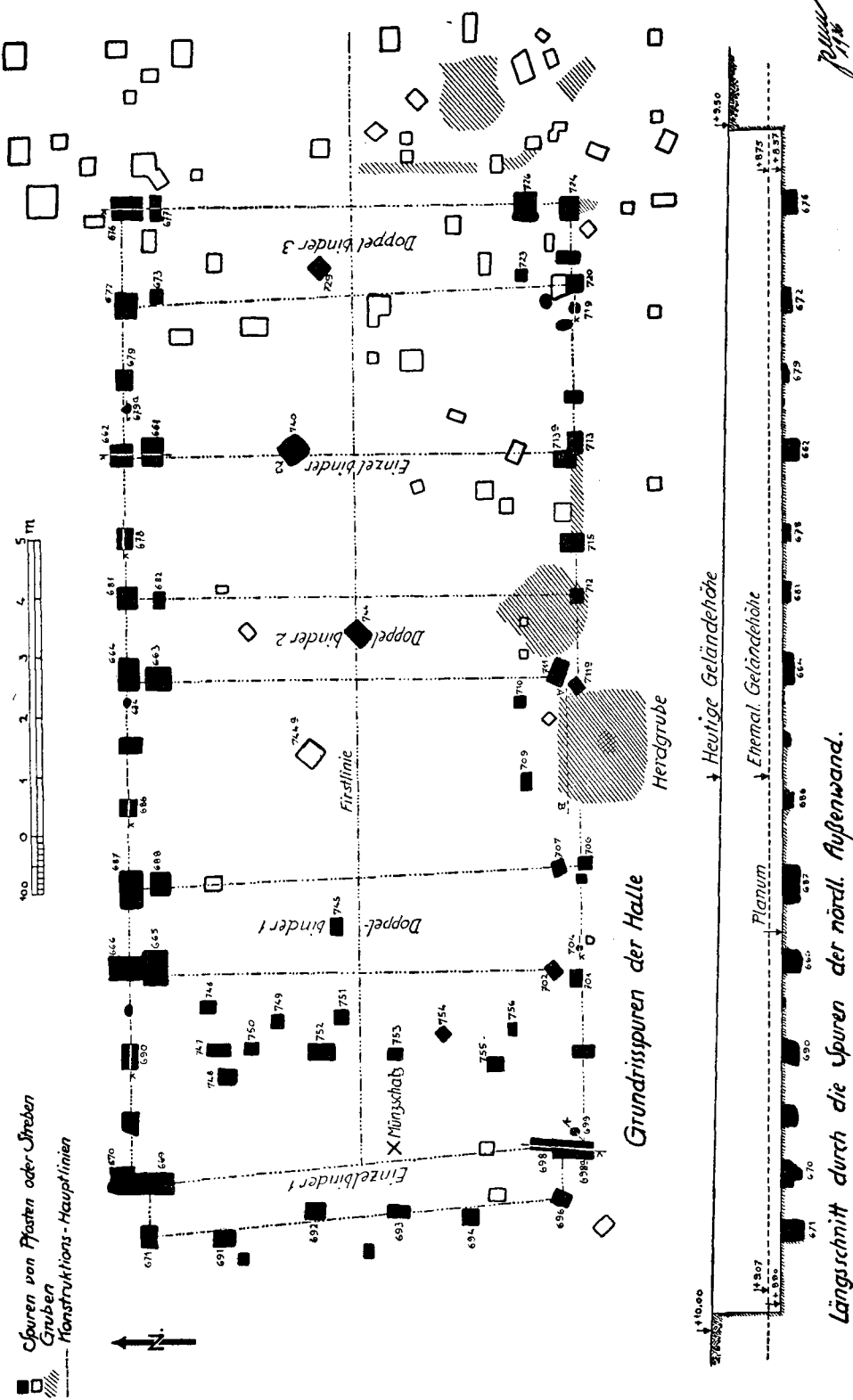


FIG. 37

WESTICK, near KAMEN, GERMANY (pp. 134, 136 ff.)
Plan of house (after Klein, *Westfalen*, as in note 6, fig. 2, by courtesy)

end of cruck development, yet even there a wall stud stands immediately outside every cruck blade to perpetuate this ancient structural relation.⁵⁶ Hence on general grounds we may postulate a cruck solution for any arrangement of post-holes like that at Westick, as did von Uslar for another excavated plan at Haldern near Wesel on the right bank of the Rhine. The slight depth of undisturbed soil gave no clear evidence of post-holes sloping inwards, only a faint suggestion of them. The site was occupied in the 1st century A.D.⁵⁷ It may be added that the only claim so far made in print for cruck construction on an English site, one at Bramble Bottom near Eastbourne in Sussex, is unproved.⁵⁸

One other piece of evidence tending in the same direction may be quoted from Ireland. The stone church on St. MacDara's Island (co. Galway) has at the gable ends *antae* or projections which were originally carried up the roof slope to the apex and seem, as Leask remarks, to reflect the influence of cruck construction. The church itself cannot be closely dated, but is probably of the 12th century.⁵⁹ Certainly the *antae* look like a transmutation of crucks into stone, and indeed it is hard to see how else such a distinctive form might have arisen.

Three sorts of evidence thus point to the high antiquity of the cruck technique. A further argument to the same effect has been based by Peate⁶⁰ on the 10th-century codes of Welsh Laws, which refer to the 'three timbers' allowed for the building of a house. Clearly other material must have been used as well, but it is reasonable to suppose that the three timbers were sufficient for the essential supports of the roof. Now these words could be interpreted either to mean a ridge-post roof—two earth-fast posts supporting a ridge-piece—or as a cruck construction. Since three timbers are not enough to build a cruck framework by themselves, it has been suggested that two were used for the open truss and the third for the ridge-piece, with stone gables at the ends; but for technical reasons, stone gables are extremely unlikely in the 10th century in anything save a building of exceptional importance. The other possibility is that two of the timbers were split lengthwise to form pairs of blades as was done in the 15th-century crucks of Monmouthshire. But this, too, is a quite advanced technique, one which we do not yet know Welsh carpenters to have been capable of at so early a date. So Peate's interpretation of the evidence remains a possibility that needs archaeological confirmation; and this is usually the case with literary evidence.⁶¹

⁵⁶ *Op. cit.* in note 40, I, 98. The explanation of the stud placed in front of the cruck blade (*ibid.*, p. 40, note 4) is technically correct but historically incomplete.

⁵⁷ R. von Uslar, 'Die germanische Siedlung in Haldern bei Wesel am Niederrhein,' *Bonner Jahrbücher*, CXLIX (1949), 105-145.

⁵⁸ R. Musson, 'A thirteenth-century dwelling at Bramble Bottom, Eastbourne,' *Sussex Archaeol. Coll.*, XCIII (1955), 157-170. Recently J. W. G. Musty and D. J. Algar have excavated a cruck-trussed building at Gomeldon, near Salisbury (for summary of excavation see below, p. 289 and FIG. 94).

⁵⁹ H. G. Leask, *Irish Churches and Monastic Buildings*, I (Dublin, 1955), 29-30, 37-39; M. and L. de Paor, *Early Christian Ireland* (London, 1958), p. 59. For the date of the church Leask, *op. cit.* pp. 31, 37, suggests the 12th century by analogy.

⁶⁰ Peate, *op. cit.* b in note 2 and *op. cit.* in note 4, and a full discussion in *The Welsh House* (London, 1940, and subsequently Liverpool, 1944 and 1946), ch. vi.

⁶¹ The following are the principal contributions to the controversy: Aileen Fox, 'Dinas Noddfa,' *Archaeol. Cambrensis*, 1937, pp. 247-268; Peate, *op. cit.* (1946) in note 60; Walton, Peate and Raglan, *opp. cit.* in note 2; and Sir C. Fox, 'Round-chimneyed farmhouses of north Pembrokeshire,' in W. F. Grimes (ed.), *Aspects of Archaeology* . . . (1951), esp. pp. 138-143.

We have still to consider how the cruck form evolved and what purpose it was intended to serve. Here Westick with its hall roof supported partly by cruck-like constructions and partly by ridge-posts may provide a clue. If, as seems likely, some of the ridge-posts are original they suggest a transition from a structure dependent primarily on such posts to one with a monospan roof. Unfortunately it is impossible to be sure whether any or all of the ridge-posts are replacements or extra supports added later; the Haldern house, after all, had no sign of ridge-posts. But this much is clear, that buildings with a central row of posts once had a wide distribution and indeed this form of roof support is the oldest known. Childe hazarded the guess that the upper palaeolithic dwellings of Siberia had this kind of roof⁶² and even if so distant an origin can hardly yet be said to be proved, there are sufficiently numerous instances from the Danubian neolithic cultures. The classic site is Köln-Lindenthal, where a ridge-piece and two purlins were supported directly by three rows of posts, and comparable houses are known elsewhere in considerable numbers, e.g. in the Netherlands.⁶³ It would be pointless to enumerate a large number of examples, while for the bronze age, in any case, there is a gap in our knowledge of houses, but when we come to the earliest iron-age cultures the Hallstatt settlement on the Goldberg⁶⁴ produced many buildings with ridge-posts; the lesser buildings of the settlement, the farm houses with their stables and granaries, all show signs of a roof with a ridge-piece, though not all show a complete central row of posts; sometimes the ridge-posts appear in gable walls only. Although the complete body of evidence that would permit adequate discussion of the problem seems not to have been published, it is quite clear that the finest structure on the site, the chieftain's hall set within a fortified inner enclosure, had a row of ridge-posts and in consequence a non-axial hearth. A building of this quality permits the inference that the ridge-post type was the most advanced form of roof then known. Moreover such buildings continued to be put up in Germany and Denmark well into the 18th century,⁶⁵ while at Huttons Ambo in Yorkshire an early 13th-century house that can plausibly be interpreted as being of this type has been excavated,⁶⁶ and others discovered on Gelligaer Common in Glamorganshire⁶⁷ may have been in use from the dark ages up to the early 14th century.

This is the technical background of roof carpentry against which we must consider crucks; and if it be argued that the form of roof without a ridge-piece is also of high antiquity, the answer must be that the period of its origin has not yet been satisfactorily determined. Most German researchers assume that all

⁶² V. G. Childe, 'Cave men's buildings,' *Antiquity*, xxiv (1950), 4-11.

⁶³ Köln-Lindenthal: W. Buttler and W. Haberey, *Röm.-germ. Forschungen*, xi (1936), as reinterpreted by O. Paret, *Germania*, xxvi (1942), 84-103.

⁶⁴ Plan in V. G. Childe, *Prehistoric Migrations in Europe* (Oslo, 1950), fig. 178.

⁶⁵ Germany: G. Eitzen, 'Alte Bauerngehöfte in der hohen Eifel,' *Rhein. Vierteljahrsblätter*, xxiii (1958), 275-290, figs. 1-6; *Das Bauernhaus in Kreise Euskirchen* (1960), figs. 4, 5; H. Frenzen (ed.), *Landkreis Prüm* (Speyer, 1959) (= *Die Landkreise in Rheinland-Pfalz*, iv), pp. 116-7, fig. 10.

Denmark: Zangenberg, *op. cit.* in note 18, figs. 58-64; the farm at Lundager, fig. 63, is c. 1760-70.

⁶⁶ M. W. Thompson, 'Excavation of the fortified medieval hall . . . at Huttons Ambo,' *Archaeol. J.*, cxiv (1957), 69-91.

⁶⁷ Aileen Fox, *op. cit.* in note 61, and 'Early Welsh homesteads on Gelligaer Common,' *ibid.*, 1939, pp. 163-199; Sir C. Fox, *op. cit.* in note 61.

excavated buildings with two internal rows of posts necessarily had a ridgeless roof, an assumption which, even if it were true of all the buildings they have discussed, is yet made doubtful by the recent discovery in west Yorkshire of aisled houses with king-post and ridge-roofs; they show that exceptions to this rule have existed.⁶⁸ Since a Hallstatt chieftain had a hall with ridge-posts, we can safely say that in that culture at least the technique was general for buildings of the highest quality until at least 500 B.C.

The inadequate evidence for prehistoric roof construction nevertheless provides a setting within which crucks become intelligible. In such a context as the Goldberg settlement the function of the cruck is to clear away the inconvenient central posts from the floor space of the hall. Looking again at the large building on the Goldberg already referred to, the inconveniences are manifest; the hearth is not axial, and so practically blocks one of the two aisles. It can be supposed that a prime objective of the carpenter was to provide an architectural setting wherein the ceremonial of these petty Hallstatt kingdoms could be displayed to the best advantage, just as late medieval English carpenters strove to provide an impressive aisleless hall. That is by no means to claim that crucks are a Hallstatt invention, merely to indicate the kind of social and political setting in which such a technical advance might be expected. Moreover, the excavation at Haldern suggests that crucks were already being used in an iron-age culture at least as early as the middle of the 1st century A.D. Von Usler pointed out that the Haldern and Westick halls are both about 20 metres long and respectively 7 and 8 metres wide,⁶⁹ i.e. some 23 and 26 feet, or about the same width as the somewhat shorter (14 m.) Hallstatt chieftain's hall on the Goldberg. Further, the use of crucks for what were obviously pretentious buildings shows that, like so many technical advances in building, they were first introduced in important structures and only gradually descended to humbler uses.^{69a}

At this point the claim that crucks exist in the Scandinavian countries must be dealt with in more detail. Post-holes in a few excavated houses have been claimed by Zangenberg, Vreim and Walton⁷⁰ to prove cruck construction in Danish iron-age buildings; but the evidence is negligible. A second line of argument is that certain very simple huts in these countries were the modern successors of the kind of structure from which British and other crucks developed, and if this were true it would nullify the preceding argument. Innocent first introduced Scandinavia into the discussion of crucks with a reference to the Danish buildings known as *stridsuler*⁷¹ (FIG. 29, *k*). Then in the first volume of *Folk-liv* (1937) appeared a famous article by Halvor Vreim entitled 'The ancient

⁶⁸ As noted in a paper, 'Halifax aisled halls,' read to the Society of Antiquaries of London, by R. W. McDowall and F. Atkinson, 7 May, 1959; publication forthcoming.

⁶⁹ *Op. cit.* in note 57, p. 135.

^{69a} But M. W. Barley (*op. cit.* in note 2) considers surviving English crucks to be the 'professional carpenter's version of the simple peasant shack'. The context—a review—precluded discussion of this hypothetical upgrading of a technique, and E. A. Gee, *Med. Archaeol.*, vi-vii (1962-3), 367, holds the same view.

⁷⁰ See note 17, esp. H. Hinz, *op. cit.*

⁷¹ *Op. cit.* in note 9.

settlements in Finnmark⁷² in which he claimed that certain very simple cabins and tents incorporated cruck construction. The assertion was repeated in turn by Erixon, Peate and Walton⁷³ and the two last named have also accepted the *stridsuler* into the cruck canon.

To deal first with Finnmark, the fact that the buildings are so slight—no more, as Vreim says, than cabins (FIG. 29, j) and tents—must make them suspect. Hitherto all the structures discussed have been substantial timber buildings demanding a craftsman's knowledge of woodworking, and this applies even to the humblest structure so far published from England and Wales with the sole exception of the anomalous Strata Florida house.⁷⁴ Yet the characteristic of the principal Finnmark buildings, the Lapp *kâta* or turf huts, is their extreme simplicity compared with permanent buildings, though they may be very complicated as cabins and tents go. Moreover they do not conform to the structural principle of a cruck; in them, wall and roof construction are one, whereas in true cruck construction they are quite separate, and are separate in every surviving British example. Again, if the two excavated German houses are correctly interpreted as crucks this separateness is fundamental to the type, from which it follows that no tent-like construction can be classed as a roof-truss. Hence on all grounds the claims for Finnmark as a home of crucks are to be rejected; its huts have no place on a distribution-map. On the same grounds the farm store near Audenarde⁷⁵ should be rejected.

Denmark is a different and more puzzling case. The barns called *stridsuler* have a system of trusses in which ridge-posts alternate with a pair of tongs, that is, straight inclined timbers forming an inverted V, and supporting a yoke on which the ridge-piece rests. A notable point is that the feet of the tongs are never adjacent to the wall but half-way between wall and long axis. No building of this type appears to be earlier than the late 18th century and most are even later; all are of fir, whereas oak is invariably used in all the much older plank-built houses and barns known in Denmark as the 'bole-house' type.⁷⁶ Some English writers have made qualified claims for these buildings as a kind of cruck. Innocent, of course, did not fall into this error, merely implying that they were allied to cruck construction; Walton is less guarded, and Peate in his most recent contribution to the subject accepts them simply as crucks. The only comparable ancient structure is the Westick hall which may also have had a combination of arched inverted-V supports and ridge-posts, and the general likeness is so strong that, despite the lack of early standing structures of the sort, the Danish barns and the excavated hall must surely stand in the same typological relation to buildings with ridge-post roofs.

The structural reasoning behind the late Danish barns may be a desire to stabilize a ridge-post by a fairly simple means without using the more elaborate

⁷² See note 15.

⁷³ *Opp. cit.* in notes 12, 4, 3 respectively.

⁷⁴ *Archaeol. Cambrensis*, 1899, pp. 320-5. This building badly needs reassessment.

⁷⁵ *Loc. cit.* in note 9.

⁷⁶ M. Clemmensen, *Bulhuse* (Copenhagen, 1937), *passim*.

methods of carpentry that a true truss would entail, rather than clearance of the floor space, which is the motive underlying the cruck technique. On the whole I think it less likely that they are a new development in the 18th and 19th centuries than that they were an example of the not uncommon archaeological phenomenon of an early type surviving only in late examples. The crucks of Scotland provide a striking instance of a technique being obviously of much greater antiquity than the earliest surviving examples, and the same is true of north-west Germany; the *stridsuler* may conceivably be a comparable case. They are at best a collateral branch of the cruck family rather than members of it. It may be noted, too, that the boat-shaped houses of Denmark have nothing to do with crucks.⁷⁷ One final argument for Scandinavian crucks, put forward by Peate, is a 16th-century reference by Olaus Magnus to 'arched houses' (*arcuales*). In a 17th-century translation the relevant passage reads thus: 'Their Arched-houses are built very artificially against the force of the Winds, and falling of the Snow, for divers and necessary uses, as well with Stones, as with Wood. And such are found in Great men's houses to keep their Domestick or Country Household-stuff in . . .'⁷⁸ Certainly an arched house sounds like a cruck, but the absence of any direct evidence for a true cruck technique may suggest that a *kåta* was intended; the distinction between the two types, though fundamental, would be difficult to make clear verbally (FIG. 40).

Besides the *stridsuler* other kinds of roof structure can be related more or less distantly to crucks, and seem also to have been confused with them. Thus Soeder has recently made claims for a type of roof construction in northern France⁷⁹ of which the essentials are a king-post standing on a tie-beam and held firmly upright by two curved struts, and carrying a ridge-piece. Without illustration or exact description it would be difficult to distinguish it from a cruck of the type found in Belgium, where the blades are tenoned at the top into a king-post which carries the ridge-piece and itself stands on a collar-beam mortised into the blades⁸⁰ (FIG. 29, *h*). Now, these French roofs are clearly not any kind of cruck. Yet it is perhaps to these that a much-quoted sentence of Erixon's refers: 'What are known as *stritsuler* in Jutland and a number of bowed inclined props in half-timbered architecture in West Europe right down to North Spain are possibly to be regarded as relic forms of constructions of the same kind as the crucks form.'⁸¹ Nevertheless, the likeness between the type of roof Erixon and Soeder describe and crucks is sufficiently strong to warrant further discussion, in which I shall take for granted that the general background of prehistoric house construction, as well as the detailed evidence of Westick, suggests a close link between crucks and the ridge-post roof, and consequently with the latter's

⁷⁷ As claimed by Walton, *op. cit.* in note 3. Cf. Smith, *op. cit.* in note 25.

⁷⁸ Olaus Magnus, *History of the Goths, Swedes and Vandals* . . . (London, 1658), p. 149; checked with Latin text, *Gentium Septentrionalium Historiae Breviarum* (Amsterdam, 1669), p. 309. The modern edition cited by Peate (*op. cit.* in note 4) was not available to me, nor John Granlund's comment referred to by P.

⁷⁹ Soeder, *op. cit.* in note 7, quoting J. Raffi in *Techniques en Architecture* (1947), pp. 16 ff.

⁸⁰ Trefois, 1950 (*op. cit.* in note 8), fig. 63, Westkapelle.

⁸¹ S. Erixon, 'West European connections and culture relations,' *Folk-liv*, 1938, pp. 137-172; quotation from p. 168.

successor, the king-post roof.⁸² If this be accepted as a working hypothesis it may explain certain features not only of cruck construction but also of the various forms of the king-post roof.

At this point a typological scheme must be presented summarily since there is not space to describe the relevant roofs first and systematize afterwards; in passing, it conflicts with Walton's cruck typology.⁸³

The primary prehistoric mode of roof support is the ridge-post. Roofs preserving the ridge-piece developed in two main ways, both of which superseded ridge-posts; the first was the use of crucks, the second, a king-post raised on a tie-beam. A third method, using two rows of posts instead of one, and carrying the king-post on a tie-beam spanning the middle aisle, has only recently been discovered⁸⁴ and seems to be a less common survival, without prejudice to the frequency of its occurrence prior to the 15th century. Besides these, an entirely new technique was developed at some early but disputed date which dispensed with the ridge-piece and used only trussed rafters; of its origins we can say little with certainty and know only that over large parts of central and north-west Europe it superseded completely all forms of ridge roofs.⁸⁵

Since these various methods have to be studied from surviving rather than excavated examples, we are perforce dealing with partial distributions and the ends of typological sequences. The progress from ridge-posts to crucks occurred during the first four centuries of the Christian era and perhaps earlier, the new technique being used either alone or in combination with ridge-posts. The details of the development of the cruck are unknown, but several forms may have developed contemporaneously for centuries. Hence in direct line of descent from Westick stand the cruck-supported king-posts found in Leicestershire and elsewhere (FIG. 29, *a*) and perhaps too the yokes or collars supporting a ridge-piece directly, such as are found in Leicestershire⁸⁶ and other counties. Then there are the pure crucks which, viewed as a system of roof support, show little trace of development: progress lay in improving the curvature of the blades so that they would support purlins without the use of any intermediate timbers, and in integrating the roof structure with the side walls.

The late Monmouthshire crucks (FIG. 33, *a*) represent the highest technical achievement of this kind; earlier crucks, even in buildings of good quality, had a much less pronounced curvature—Pistyll is the only one of the kind in Monmouthshire,⁸⁷ but Littywood (Staffs.)⁸⁸ is an excellent 14th-century specimen

⁸² No detailed study has yet been made of this development, but the evidence for it is clear: cf. Smith, *op. cit.* in note 25, pp. 128–9. King-post roofs also occur, though rarely, in the Belgian province of Limburg: Josef Weyns, 'Stand und Aufgaben der Bauernhausforschung in Belgien,' *Tagungsbericht des Arbeitskreises für deutsche Hausforschung, Monschau* (1953), pp. 44–59, esp. fig. 6c.

⁸³ *Op. cit.* in note 31.

⁸⁴ See note 68.

⁸⁵ B. Schier, *Hauslandschaften und Kulturbewegungen im östlichen Mitteleuropa* (Reichenberg, 1932), pp. 44–45, suggests c. A.D. 600–800. A. Zippelius, 'Das vormittelalterliche dreischiffige Hallenhaus in Mitteleuropa,' *Bonner Jahrbücher*, CLIII (1953), 13–45, takes the trussed-rafter roof (*Sparrendach*) back to the Goldberg settlement (see plan, *op. cit.* in note 64).

⁸⁶ *Op. cit.* in note 28, figs. 8, 12.

⁸⁷ *Op. cit.* in note 40.

⁸⁸ S. R. Jones, in *V.C.H. Staffs.*, IV, 75; plan and sections.

of cruck-truss that is hardly curved at all. Parenthetically it may be observed that in a building of any considerable height the oaks required for markedly curved or elbowed crucks would be almost impossible to find. This explains the use of the so-called ogee cruck (PL. VI) and, in barns where only span matters and not appearance, the triply-curved blade. The use of secondary timbers supported at one end by a spur tie and at the other by the top of the cruck blade, to carry the purlins, is common enough; they almost qualify to be called principal rafters. The same process of technical refinement leads to a paring away of the foot of the blades and has been dealt with by Fox and Raglan.⁸⁹ The question whether straight blades should be regarded as crucks is answered positively by the houses at Mappleton in east Yorkshire,⁹⁰ where the blades are straight or as near so as makes no difference. It is the relation of structural members, not curvature, which proves the true criterion of a cruck. The slightly curved shape exemplified at Drayton in Oxfordshire (PL. VII) is probably the commonest, but others with a double or ogee or even a triple curvature are not uncommon. It is unsound to regard the finely-shaped elbow crucks of Monmouthshire either as the normal form or the normal level of craftsmanship. They are the peak of cruck development, where the blades and the timber-framed walls had been integrated into a completely unified structure. Throughout its long history the cruck was largely independent of the side walls and only in the 15th and early 16th centuries were the two elements united. A well-finished cruck at Warrington (PL. VIII), which can hardly be earlier than the middle of the 15th century, is fairly representative of English crucks.

The stages in the gradual integration of wall and roof are difficult to define and may most easily be stated in a chronologically reverse order. Fox and Raglan have shown how the 15th-century crucks of Monmouthshire incorporate walls of timber framework.⁹¹ At the same time a few small cruck-trussed houses in districts where stone is easily got have the blades raised several feet off the ground and set in stone walls. This may be termed a raised cruck⁹² (FIG. 33, *b*). Such a high degree of integration using either method is late and relatively rare. Elsewhere, e.g. in Leicestershire,⁹³ the attempt to bind the framing and the cruck-trusses into a unified whole hardly got beyond tenoning a wall-stud into a notch cut in the base of the blade near its foot—a widespread method found also in Berkshire and Dorset.⁹⁴ In northern stone districts, e.g. Yorkshire, there is so far no sign of the sophisticated device of the raised cruck: there the blades usually stand on large stones ('cheeses') just inside the walls. Not a few of the late crucks of northern England appear to have had stone walls from the first, though proof

⁸⁹ *Op. cit.* in note 40, fig. 19A.

⁹⁰ S. O. Addy, *Evolution of the English House*, revised by J. Summerson (1933), p. 64.

⁹¹ *Op. cit.* in note 40, pp. 39–41. See also the important article by P. Smith and D. B. Hague, 'Ty Draw,' *Archaeol. Cambrensis*, 1958, pp. 109–120, which has excellent drawings of a complicated but superbly integrated structure, esp. fig. 24.

⁹² R. A. Cordingley, 'British historical roof-types and their classification,' *Trans. Anc. Mons. Soc.*, n.s. ix (1961), 111–2.

⁹³ *Op. cit.* in note 28.

⁹⁴ Berkshire: D. Portman, 'Cruck houses in Long Wittenham,' *Berks. Archaeol. J.*, LVI (1956), 1–11. Dorset: discovered by T. W. French in course of R.C.H.M. survey.

of this is at present lacking. A typological stage, intermediate between the Monmouthshire and Leicestershire houses, appears in a barn at Arley (Cheshire),⁹⁵ where more than one tie-beam is used to attain an adequate union of wall and truss. Unfortunately the evidence of standing structures can take us back no farther than the stages exemplified in Leicestershire and Yorkshire. The lateness

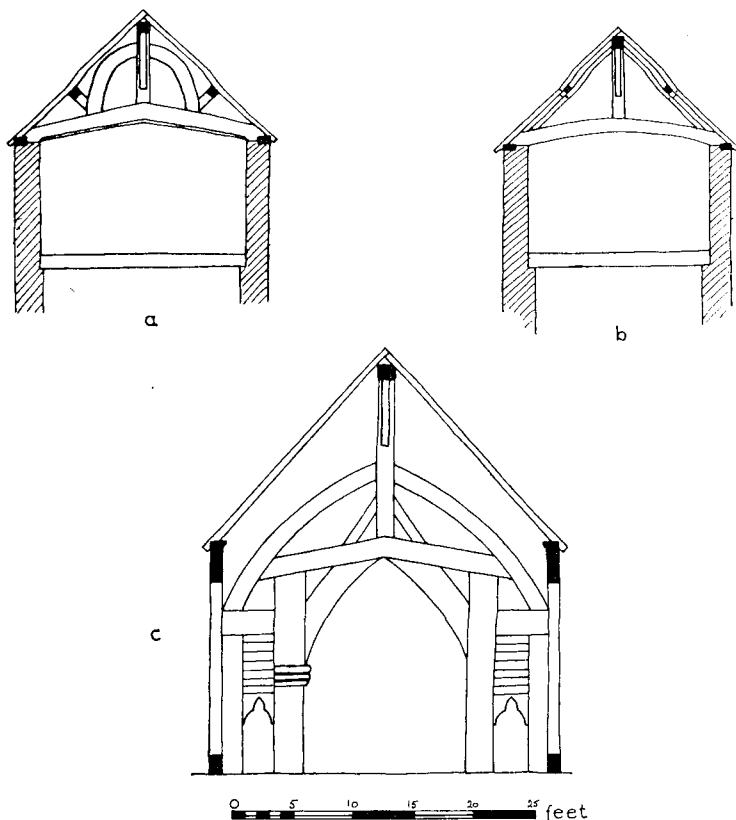


FIG. 38

ROOFS IN NORTHERN ENGLAND (p. 144)

a, Preston Patrick Hall, Westmorland, W. wing (after R.C.H.M. ms.); b, Preston Patrick Hall, court room (after R.C.H.M. ms.); c, Radcliffe Tower, Lancs. (after Whitaker, *op. cit.* in note 97)

of these developments within the cruck tradition tallies with excavation evidence in showing the relative unimportance of side walls in peasant building prior to the 14th century, by which I mean that the walls were not load-bearing to any significant extent.

For the second line of roof development, from ridge-post to king-post—a line which has greater relevance to the argument than might at first appear—the evidence is not so straightforward. Taking first the evidence of the houses in the

⁹⁵ Buckler drawing, B.M. Add. Ms. 36436, f. 413; also Fletcher Moss, *Pilgrimages to Old Homes* (1903), 298.

northern counties of England (excluding, possibly, the East Riding of Yorkshire but probably adding east Cheshire) most buildings of any pretensions appear to have roofs with tie-beams upon which stand king-posts.⁹⁶ From unpublished manuscript sketches in the archives of the Royal Commission on Historical Monuments a development can be inferred in Westmorland (FIG. 38). In the earlier roofs the king-post is supported by two struts either curved or curved only on the soffit, which do not carry purlins. They are therefore not in the true sense of the words principal rafters. The extreme case is represented by Preston Patrick Hall, where the king-post is flanked by two boldly curved struts which are made to support purlins (FIG. 38, *a*), while in the court room of the same building the effect of a principal rafter is achieved by an under-rafter; into this, and into the common rafter, a cleat is tenoned to keep the purlin in position (FIG. 38, *b*). The point is that this construction was conceived of as a king-post roof in which the support of purlins was a secondary consideration. The general line of development here, as in crucks, begins with the concern to support a ridge-piece and proceeds to the secondary consideration of providing purlins, supporting them by short curved struts at Preston Patrick and by pseudo-principals at Upton-on-Severn (PL. VI); both methods became obsolete when proper principal rafters were developed. These considerations perhaps make intelligible the long demolished roof of Radcliffe Tower in Lancashire⁹⁷ (FIG. 38, *c*). The main part, the open truss, is simply a king-post on a tie-beam. The spere-truss is a most remarkable construction specially adapted to its function in the plan, yet withal retaining certain structural elements from a quite remote past. That is how I interpret the great curved braces which spring from well below the wall-plate to support the king-post; it is precisely their dissociation from both tie-beam and wall-plate which relates this method of construction to the blades of a cruck-truss and invites comparison with the structural systems of Westick and the *stridsuler*.

The third line of development, in which a nave-and-aisles structure is combined with a king-post roof, is too recent a discovery to try to relate it to the preceding types, and must await publication of the material. The principal question it raises is whether, within the class of roofs with ridge-pieces, a system of support using two rows of posts had been developed independently, or had been taken over from the important class of roofs without ridge-pieces. Should the former be the case, as is most probable, it implies that a nave-and-aisles structure is being used as an alternative, in large buildings, to crucks and their allied forms. Unfortunately this fascinating problem cannot be tackled until fuller evidence is available, but it may be noted that Hermann Hinz has advanced this argument on material derived from excavation.⁹⁸ He concluded that the cruck was a special form of roof support and that the aisled structure was the normal one in the late pre-Roman iron age, and this may well be true for certain parts of Europe.

⁹⁶ Evidence from the north of England is hard to obtain. I am indebted to my colleagues, Mr. C. F. Stell and Mr. R. W. McDowall, the late Prof. R. A. Cordingley and Dr. T. L. Marsden of Manchester University, and Mr. F. Atkinson, director of the Bowes Museum, for information.

⁹⁷ T. D. Whitaker, *History of Whalley* (1801): reproduced *Antiq. J.*, XL (1960), pl. xxvii, *a*.

⁹⁸ Hinz, *op. cit.* in note 17.

That is as much as can be said about the relationship between the two main types of roofs with ridge-pieces, i.e. the king-post and the cruck. There is a third and almost certainly later type, the simple triangular truss comprising a tie-beam into which the principal rafters supporting the ridge-piece are tenoned (FIG. 33, *e*). A variant form dispenses with the tie-beam and employs instead a collar-beam tenoned into the principals. Unfortunately this apparently simple and logical form has aroused little interest because it is regarded as the 'natural' form of roof by those who interpret every roof as a more or less logical solution of a structural problem untrammelled by tradition, and consequently its distribution is hard to map. The few examples that have been drawn or photographed are mainly those spanning single-story halls and seem to occur wherever crucks are found but usually in the somewhat better houses. Monmouthshire is a case in point, where Hendy, a medieval stone house of some pretensions, has collar-beam trusses;⁹⁹ the same is true of Herefordshire, and a map of the county showing the distribution of principal-rafter roofs is instructive (FIG. 36). They are concentrated in the central plain of Herefordshire, avoiding on the whole the upland areas where crucks are concentrated, and the houses in which they occur are usually bigger than those with crucks.

Since roofs with principal rafters and ridge-pieces are completely absent from south-eastern England, they cannot be intimately connected with the timber-framed construction which some have associated with that region;¹⁰⁰ moreover in searching numerous sources for continental roofs I have rarely found anything like the type outside England. If this rarity on the continent be a fact it strengthens the likelihood of a link between crucks and framed trusses which is at present difficult to demonstrate on purely structural grounds, although this has been maintained by R. A. Cordingley on the basis of the way purlins are supported.¹⁰¹ Two other points are relevant; some western roofs have principal rafters which appear to taper slightly in the manner of crucks; and, in the class of base-crucks, the upper roof of trussed-rafter type, which most of them have, is replaced in the Herefordshire examples alone by one of principal-rafter type¹⁰² (FIG. 33, *f*). These details at least suggest that principal rafters and crucks are closely connected without proving the descent of one from the other.

Much has been written about the treatment of the apex.¹⁰³ It has been claimed that the crossing of the cruck blades is the earliest form of housing for the ridge-piece, since this appears to be the most rudimentary form and has a very wide distribution. On the other hand it could equally well be set at the end of a typological sequence as a degenerate form of the second half of the 17th century and later, a period to which some roofs with principal rafters so crossed can be

⁹⁹ *Op. cit.* in note 40, I, 84.

¹⁰⁰ The distinction drawn by Cordingley between the cruck and box-frame (timber-frame) areas of England is illustrated by T. L. Marsden, 'A timber-framed town house in Manchester,' *Trans. Anc. Mons. Soc.*, n.s. VI (1958), 110-114; also Cordingley, *op. cit.* in note 92.

¹⁰¹ R. A. Cordingley, *op. cit.* in note 92, esp. pp. 80-82.

¹⁰² Smith, *op. cit.* in note 25, pp. 130-3.

¹⁰³ See especially Walton, *op. cit.* in note 31, and, following him, Webster, *op. cit.* in note 28. To this Peate, *op. cit.* in note 4, adds an inconclusive philological discussion of the word 'cruck'.

ascribed with certainty.¹⁰⁴ The only other type that stands out quite clearly is the one using a king-post upon a collar. A small version of it occurs in Leicestershire, Staffordshire and Somerset,¹⁰⁵ where the blades may be fastened by a yoke or very short collar upon which stands a short king-post. Sometimes the ridge-piece rests directly on the yoke. The relation between these and other forms is quite obscure and hardly worth arguing about without more evidence, which theoretically could be obtained in two ways. If crucks could be dated more closely, by building up either a national or local series, then the various apexes might fall into a chronological and perhaps a typological series. But in view of the great difficulties of dating, which itself often depends on the researcher's own typology of such detail, the second method might be worth trying first: if a sufficiently large body of evidence about apexes were built up, distribution-maps might well suggest a relationship between them. What constitutes adequate information is hard to say—perhaps two hundred examples, provided the distribution were not too uneven, would suffice as a basis for a tentative typology which could be tested in the field. This approach is essentially that adopted by Gordon Childe for the typology of megalithic tombs¹⁰⁶ and might be equally fruitful.

The form of the cruck blades and the manner of their making are closely linked. Early crucks were cut from two separate trees, a method which was only superseded towards the end of the middle ages by halving a single oak to produce identical blades. It was never universal: most of the Leicestershire cruck blades seem not to have been halved, though the point is not specifically mentioned. A Buckler drawing of a building near the market at Witney¹⁰⁷ suggests but does not prove that the use of separate timbers persisted far into the middle ages. It was apparently an anomalous kind of two-tier cruck not otherwise recorded; the lower half uses timbers of 9 by 9 inch scantling, the upper half one of 7 by 7 inches. The fact that both are of square section makes it unlikely that this is merely a reduction of a single piece of oak.

The problem is closely related to the paring away of the feet of the blades which is so remarkable a feature in Monmouthshire; the explanation there advanced, that it enabled the feet to be tenoned into the sills that came in with timber-framing is certainly correct. It is important to discover as accurately as possible when this was taking place in various parts of England and Wales, because this must be related to the chronology of timber-framed building, using that term to mean a type of building with sills throughout, into which all uprights are tenoned, and with the upright and horizontal members joined by diagonal braces.

¹⁰⁴ Principal rafters crossed at the apex are quite common, for instance, in south Warwickshire (personal observation); all are of the late 17th century or later.

¹⁰⁵ Leicestershire, *op. cit.* in note 28; Staffordshire, examples at Lichfield and Haughton (*ex. inf.* S. R. Jones); Somerset, *ex. inf.* R. W. McDowall.

¹⁰⁶ V. G. Childe, 'Scottish megalithic tombs and their affinities,' *Trans. Glasgow Archaeol. Soc.*, n.s. viii (1933), 120-137: 'The oldest types will be those most accurately reproduced in the greatest number of distinct regions; types localized in specific areas will be later inasmuch as they represent regional variations . . .'

¹⁰⁷ B.M. Add. Ms. 36436, f. 688.

Turning next to the several derivative types of cruck the earliest is the base-cruck (above, p. 129) which was already developed by the middle of the 13th century. In the closely-allied class of two-tier cruck, which appears to be less common, the only well-dated monument as yet is the abbot's barn at Glastonbury (FIG. 33, *c*) lately ascribed to the early 16th century on heraldic evidence.¹⁰⁸ A third type is the scarfed (sometimes called jointed or false) cruck. Best known in Dorset, Somerset and Devon and perhaps common in some adjoining counties (FIG. 30), its distribution is nevertheless much wider, extending into central Wales and as far north as Skye and Ross.¹⁰⁹ It occurs chiefly, and perhaps solely, in conjunction with cob or stone walls, and is commoner in barns than houses. Walton has suggested that the scarfed cruck was intended to secure 'an economy in timber by allowing an upright member to serve in place of two, the wall-post and the cruck'.¹¹⁰ Certainly the scarfing together of two members reduced the need for good quality timber of large dimensions and hence the cost of building, yet it is noteworthy that the scarfed-cruck areas are those where timber-framing is rare or non-existent. Thus the idea of economy of timber, though perfectly correct, stemmed not from the wish to eliminate a wall-post but from the need to dispense with long curved timbers for the blades. Two factors in conjunction account for the distribution: it comprises areas backward in material culture, where in consequence the cruck technique long survived, which were also areas with little good timber. It may be relevant to note that carpenters in the western counties sometimes articulated roofs in what appear to be unsuitable ways,¹¹¹ so perhaps the persistence of a carpentry tradition should be considered.

Since crucks are found, albeit rarely, in various parts of Europe, derivative forms should also appear, and indeed field-work in Belgium, France, Germany, Holland and Italy has already produced a considerable number of examples. What may well be the largest base-cruck ever built spanned the Hall of the Knights at The Hague (FIG. 39, *c*); it was finished in 1295.^{111a} A base-cruck combined with an upper roof of trussed rafters is recorded from Zoetenaai-Eggerwaartskapelle (FIG. 29, *g*);¹¹² crucks can be combined with an aisled structure, as at Westkapelle (FIG. 29, *h*); and not a few Belgian and Dutch roofs suggest that there, as in England and Wales, the cruck was adapted in ways increasingly remote from its original form.¹¹³ In France a fine upper-cruck is recorded from Gourdon in Périgord (FIG. 39, *e*). Soeder has published a number of upper-crucks from the Venezia (FIG. 29, *i*) and even a roof in which five pairs of what are, in

¹⁰⁸ N. Pevsner, *South and West Somerset* (Buildings of England series, 1958), p. 177: 'the arms of Abbot Bere date it as c. 1500 or a little later'.

¹⁰⁹ Skye: J. Walton, 'The Skye house,' *Antiquity*, xxxi (1957), 157.

Ross: *ex. inf.* R. W. McDowall.

¹¹⁰ *Op. cit.* *d* in note 2.

¹¹¹ E.g. a cruck-type roof at Butleigh Court, Somerset (B.M. Add. Ms. 36436, f. 394), has what appears to be a lap joint across the blade secured with four pegs.

^{111a} Drawings, F. Ostendorf, *Geschichte des Dachwerks* (1908), figs. 247-247b; for the date, Netherlands govt. pamphlet, *The Hague: Mirror of History* (1953), p. 17. Ostendorf detected English influence in this roof. Mr. H. Janse kindly informs me of similar roofs at Bruges, Damme and Brouwershaven.

¹¹² Trefois, 1950 (*op. cit.* in note 8), fig. 63, i.

¹¹³ See Ostendorf, *op. cit.* in note 111a, and Trefois, *op. cit.* in note 8.

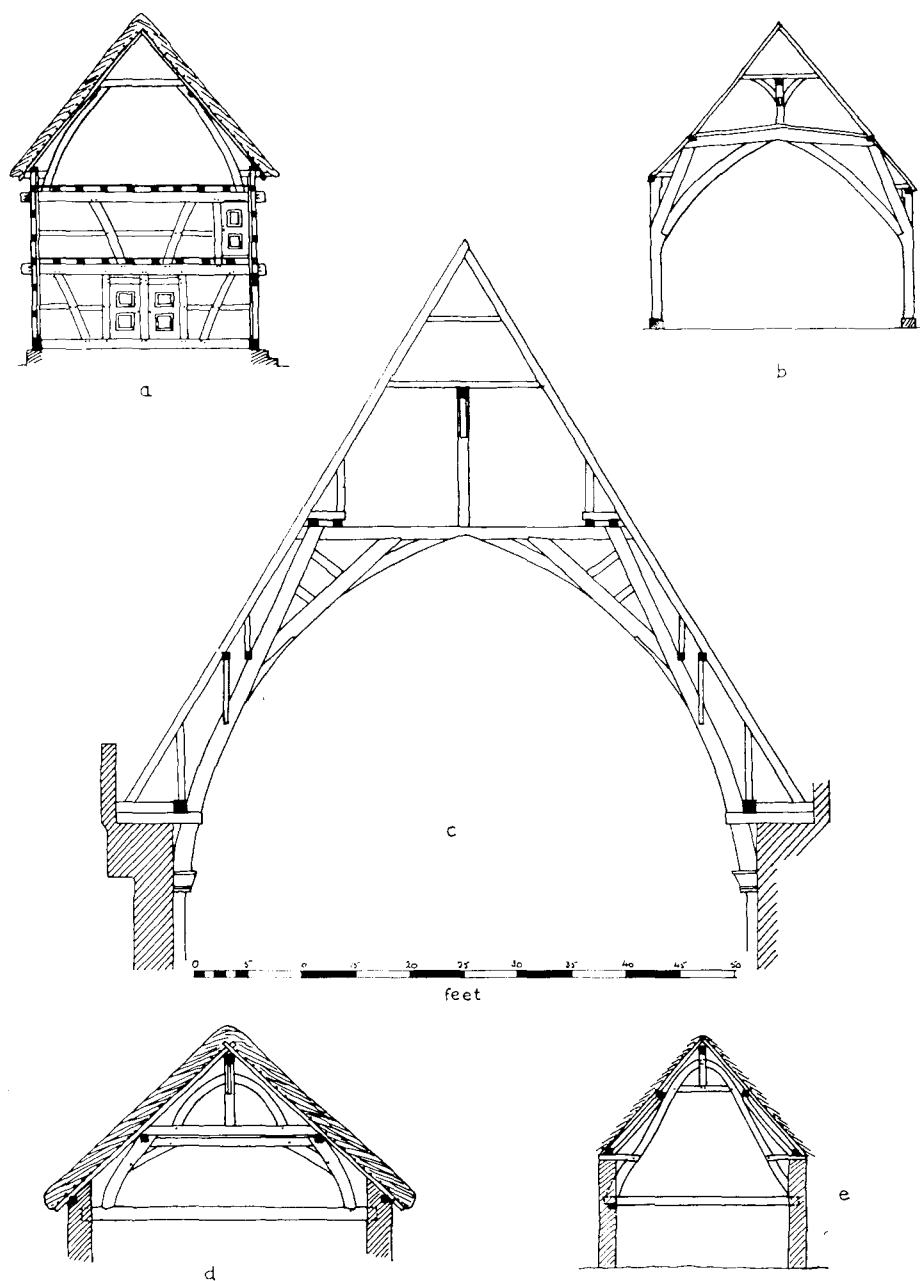


FIG. 39

EXAMPLES OF CRUCKS FROM THE CONTINENT AND SUSSEX (pp. 129, 147, 149)
a, Ensen, Germany (after Eitzen, *op. cit.* in note 65, fig. 17); *b*, Tickerage, West Hoathly (after Mason, 1957, *op. cit.* in note 45, p. 83); *c*, The Hague, Hall of the Knights (after Ostendorf, *op. cit.* in note 111a, fig. 247); *d*, Buchet, Germany (after Frenzen, *op. cit.* in note 65, p. 116); *e*, Gourdon, Périgord (after Walton, *Gwerin*, v (1961), fig. 2)

effect, upper-crucks replace, in one truss, five vertical posts.¹¹⁴ The recent work of Gerhard Eitzen has produced several roofs in the Euskirchen district of Germany wherein the cruck blade is used in combination with other techniques to provide a clear attic story uncluttered by posts (FIG. 39, *a*)¹¹⁵ and similar constructions have been recorded in the Prüm district (FIG. 39, *d*).^{115a} That the curved members are really descendants of the cruck I consider proved by the way the purlins are slotted into the back of them; this is the criterion adopted by R. A. Cordingley to distinguish the cruck tradition from the 'box-frame' (trussed-rafter) tradition in England.¹¹⁶

The foregoing remarks raise two more fundamental problems that must be mentioned, however summarily; they are the twin problems of how such an ancient technique was transmitted and why it survived. Both must be answered ultimately in terms of social and economic history.

The first question, which needs lengthy discussion, can be answered by postulating the existence of separate carpentry traditions in the different strata of society—not entirely separate, of course, but sufficiently so to perpetuate relic techniques in the humbler forms of building. With this involved matter I hope to deal elsewhere.

The second question amounts to this: why have so many crucks survived in England, and so few elsewhere, and why are the English crucks so much older than the continental examples? For an answer to these questions we must look to the different course of social development in England and various European countries which led to the disappearance of the single-story hall-house at different times in the respective countries. W. G. Hoskins quotes Professor Cippola as saying that such houses disappeared in Italy as early as the 14th century and in France no later than the 15th century,¹¹⁷ so that in both countries the cruck-truss would have become obsolete for houses thereafter, exactly as it did in Monmouthshire within a generation or so in the middle of the 16th century.¹¹⁸ Only in remote cultural backwaters such as parts of Scotland, where single-story houses remained in use, did the cruck-truss persist in use.¹¹⁹ In most of north Germany the technical limitations of the cruck had long caused it to be superseded in the much larger houses there by aisled constructions which permitted animals and crops to be housed all under one roof.

It is impossible here to take each region with crucks or derivatives in turn and consider why and when some more advanced type of construction became predominant, forcing the cruck to humbler uses; it suffices to point out the nature of such changes. This enables us to see why English and Welsh crucks are so much older than any discovered elsewhere, most of them being late medieval.

¹¹⁴ Soeder, *op. cit.* in note 7, fig. 30.

¹¹⁵ G. Eitzen, 1960 (*op. cit.* in note 65), figs. 17, 18b, 24–26.

^{115a} Frenzen, *op. cit.* in note 65, p. 116.

¹¹⁶ See notes 100 and 101.

¹¹⁷ W. G. Hoskins, 'The rebuilding of rural England, 1570–1640,' *Past and Present*, no. 4, Nov. 1953, p. 54.

¹¹⁸ *Op. cit.* in note 40, vols. I and II.

¹¹⁹ Walton, *opp. cit.* in notes 33 and 109.

The people for whose use they were built still needed a hall-type building to meet their social needs, while their carpenters had developed the use of stone footings to preserve timberwork from the decay resulting from direct contact with the soil;

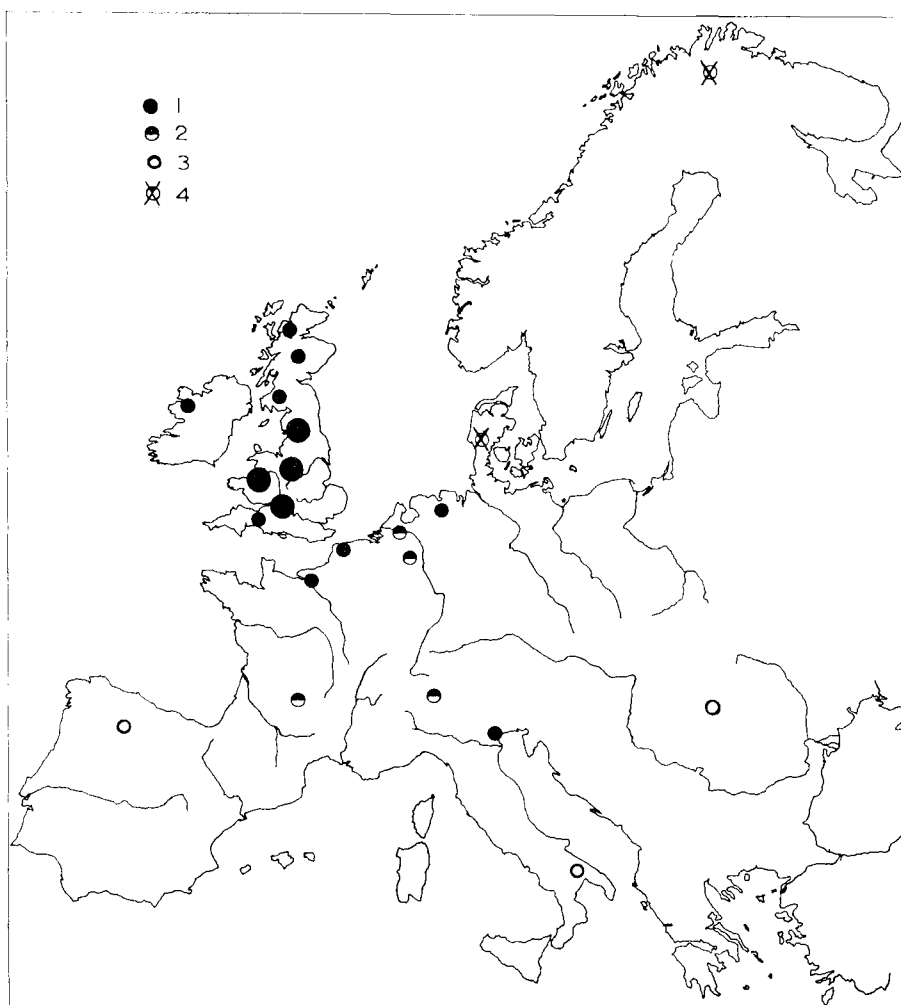


FIG. 40

DISTRIBUTION-MAP OF CRUCKS IN EUROPE (pp. 121 f., 140)

1, areas of certain cruck construction; 2, areas with derivative forms of crucks; 3, areas where crucks have been claimed but not yet fully substantiated; 4, areas where crucks have been falsely claimed

in other words, they had developed a technique of permanent building. This last factor is not negligible—in the successive farmhouses at Pebringe in Denmark footings were not used until the 18th century¹²⁰—but it is governed by the relative ease with which new ideas permeated any given society. This combination of

¹²⁰ A. Steensberg, *Farms and Water-mills in Denmark* (1952), p. 149.

factors produced crucks in England capable of standing for hundreds of years at a time when in most other countries they had been relegated to minor buildings.

By way of conclusion one general comment on the problem of cruck origins seems desirable. Raglan, Peate, Walton, Innocent and Addy, to name only some of those who have written in English on the subject, have all put forward theories but all of them save Innocent have treated the cruck in isolation, as if it bore no relation either to other medieval roof-types or to the yet earlier forms of roof that can be inferred from excavation.¹²¹ Whatever may be the fate of the theory here advanced, any rival theory is worthless that fails to put the cruck into its historical place in the general development of roof construction.

NOTE

The Society is much indebted to the Council for British Archaeology for a grant towards the cost of publishing this paper.

¹²¹ German writers have not fallen into this error; Hinz in particular, *op. cit.* in note 17, dealt with the cruck problem very well.