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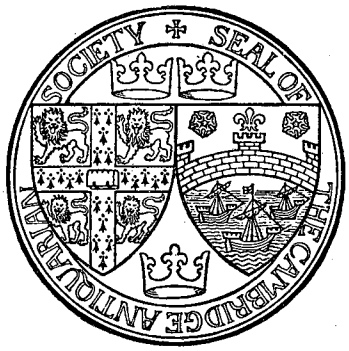

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DEIGHTON BELL

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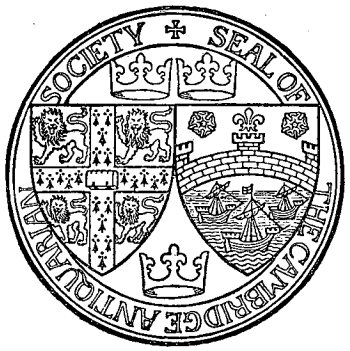

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THE 'BOAT-SHAPED' HOUSE IN NORTHERN EUROPE

BRIAN HOPE-TAYLOR, PH.D., F.S.A.

THE Buckden house is a notable addition to the growing body of post-Roman settlement-structures excavated in Britain. It presents, in association, two features of particular interest: namely, the curvature of its side-walls and the continuous slots in which they were set (see plan, p. 14).

Houses with curved side-walls have long been familiar features of certain continental settlement-sites, where as often as not they are found wholly or partly to have been emplaced in slots (as opposed to series of separate post-holes). Our acquaintance with structures of this kind in Britain, however, is slight and more recent, and in giving us the Buckden house-plan Mr Tebbutt provides also the occasion for tentative assessment of their significance in this country.

At the outset a general issue must be resolved. It is customary for houses with bowed sides, such as that at Buckden, to be described as 'boat-shaped'; but, while the term will be used here, there is need to point out that it is not altogether satisfactory on two counts. In the first place, it fails to provide an accurate or illuminating point of reference; for if we say that anything is boat-shaped we are bound to mean—or at all events to suggest—that it is pointed at one or both ends, like the generality of boats in historic times. The houses that are usually so described, however, are never pointed at either end. Further, this analogy with boats tends to invite the begging of the fundamental question as to the ultimate origin of this form of house.

It has often been alleged that the so-called 'boat-shaped' house originated directly from the use of overturned boats as ready-made roofs on land;[1] in which view the absence of 'prow' and 'stern' presumptively ceases to be a plain fact and has to be seen instead as a hypothetical modification of a prototype which is not in evidence.

The unlikeliness of this hypothesis is shown by reference to the archaeological record, wherein the house with bowed sides appears in two distinct and widely separated periods: first during the third millennium B.C.,[2] and then again during the first millennium A.D. There is no evidence of any direct connection between these occurrences, yet the correspondences between the prehistoric and the later structures are sometimes strikingly close—so close, indeed, as to indicate a real community not only in effect but in cause also. Thus, it would be most unreasonable to attribute the

[1] A view now opposed by many Continental archaeologists, but recently defended by Professor Brøndsted in *The Vikings* (Penguin Books, 1960), p. 168.

[2] H. Quitta, *Die Ausgrabungen in der Bandkeramische Siedlung Zwenkau-Harth, Kr. Leipzig*; in *Neue Ausgrabungen in Deutschland*, Berlin (1958), pp. 68–74.

later occurrence of the house-type to borrowing from contemporaneous boat-forms, if the earlier manifestation of the same form could not be explained similarly.

There is in fact no evidence to suggest that boats of the requisite type and size had any place in the repertoire of the Danubian neolithic culture in which the 'boat-shaped' house is first seen to appear. Clearly, then, the hypothesis has no ascertained basis and rests merely on a single, possibly quite fortuitous, point of resemblance between the plans of these houses and of some boats. If the matter were indeed such as could be judged solely by a comparison of outlines, we might as well be asked to believe that the house-plan was derived from the use of half-barrels. Moreover, since the critical features of the 'boat-shaped' house-plan can be otherwise explained simply and directly, hypothetical reference to boats is not only uneconomical but unnecessary.

Accordingly, the house with bowed side-walls must be considered primarily as a response to some particular need or problem in the matter of house-building itself. We have to be clear that in all its known occurrences this form was being used in preference to any of a number of established rectilinear forms; so that it may reasonably be supposed to have had some positive merit of its own.

Now it is noticeable that the form with curved side-walls appears in periods when buildings in general were characteristically large and of great length relative to width. The materials and means available naturally set a fairly severe limit to the width of roof that could readily be spanned; so that, whenever socio-economic organization required buildings with greater floor-space, the desired increase had to be achieved by longitudinal development. In direct ratio to this gain, however, the severity of certain problems of structural stability became more critical. The side-walls of a long building expose large superficial areas to wind-pressures which operate against lateral stability, and the problem becomes proportionately more serious as length is increased relative to width. Thus, the use of long, narrow buildings set a premium on every possible means of preserving lateral stability.

One expedient that was widely used was the practice of placing buildings end-on to the prevailing wind, so that only the relatively small areas of the upwind end-walls were subject to its direct pressure. However, although such judicious orientation may overall have reduced the strains imposed by strong winds, it aggravated the less obvious but equally serious problem of longitudinal stability—and it is that problem which is most likely to have been the formative context of the 'boat-shaped' type of house in both its known periods of occurrence.

It is clear that curvature of the side-walls would give much the same aerodynamic advantages as are produced in our own day by the streamlining of motor-cars, and it is at all events no more daring to suggest that those advantages were realized at an early date than to derive the form, less directly, from boats at an advanced stage of adaptation to hydrodynamic problems. Especially worthy of remark, perhaps, is the fact that in a house of this type the area of the end-walls is reduced to a minimum.

The form has other merits, moreover, which become fully apparent only when the relationship between the walls and roof is considered critically; for the most important

and inescapable implication of the bowing of the side-walls is that this kind of house had a curved roof-ridge, arching high over the wide central area of the house and falling towards a low gable at either end. Only thus is it possible for all the rafters, running upward from the curved side-walls, to have met the ridge at a constant angle. Probably the convexity of the ridge was the primary feature, to which the side-walls responded; but, however that may be, it is clear that the development, as a whole, produced a greater degree of structural stability. Aerodynamic considerations apart, the bowing both of side-walls and ridge must substantially have reduced the risk of longitudinal collapse.

This type of construction offered also some economy in material, since all the rafters save those over the middle of the building were shorter than would otherwise have been the case. Further, it would have made possible the use of relatively slender timbers for the main horizontal elements of the framework, since they would gain in strength and rigidity from being held in compression to form convex curves.

From the last point, in particular, it will be seen that nothing was more vital to such buildings than a very high degree of stability in those main vertical timbers which were set into the ground. Several methods of wall-construction were used at various times and places, but each required as its basis series of uprights set out along the curved wall-line. The upper ends of these posts would be lashed, dowelled or jointed to a simple curved wall-plate, or held between pairs of flexible horizontal timbers set on edge to bend conformably. Thus, the vertical posts could be emplaced at such intervals as purely structural needs dictated, whereafter the spaces between them would be filled with rectangular panels of wattle-and-daub or planking. That method has the merit of economy in heavy timber and carpentry; but the curved plan is so dependent on settings of vertical posts as specially to invite a further development, from frame-construction to what may be called palisade-construction, in which the walls are composed entirely of close-set, upright timbers.

The wattlework panels of early framed buildings were usually set into shallow grooves or slots in the ground to make all weatherproof, and where palisade-construction was adopted it seems naturally to have led to the further development of continuous foundation-slots or trenches as the preferable alternative to series of separate post-holes. Decay of the earth-fast ends of wall-timbers would ultimately suggest the advantage of stepping them into horizontal foundation-beams—ground-sills[1]—laid in the slots.

It is likely, though not certain, that the Buckden house rested on a foundation of this kind. Mr Tebbutt's recovery of its plan was achieved only by skill and persistence in the face of quite extraordinary difficulties, and the circumstances precluded that minute dissection of the slot-fillings which might have allowed a more positive diagnosis; but it can be said, at least, that nothing in the internal evidence is incon-

[1] This term is preferable to the almost invariably misused 'sleeper-beams', and is in accord with Continental usage. The term 'sleeper-trench' has an even more deplorable history and all too frequently is a vehicle for false and uncritical assumptions (for the effect of which on the study of Roman timber buildings, see I. A. Richmond in *Studies in Building History* (Odhams Press, 1962)).

sistent with the supposition that the house was based on ground-sills. In particular, the care that Mr Tebbutt has given to the observation and presentation of its plan enables us to see that the apparent curve of each wall was in reality composed of three straight sections, which could well be thought to represent so many straight horizontal timbers. On the other hand, it has to be taken into account that the ground-sill does not occur among the boat-shaped buildings of the historic period on the Continent, where nevertheless they are characteristically divided into three parts by internal partitions or roof-posts.

That mode of division, giving a large chamber in the middle section of the interior, flanked by a smaller compartment at each end, arises naturally from the boat-shaped form and underlines its social and economic implications; for both plan and elevation throw emphasis on the middle of the building, where it attains its greatest width and height, and determine that the function of the whole will be focused there. Such an arrangement is appropriate to this form of structure, which cannot satisfactorily be enlarged once it is built, and accords well with purely domestic use. Excavation of boat-shaped buildings of the historic period has revealed no sign of that special provision for the stalling of cattle that so frequently accompanies the domestic features of the true, rectilinear, long-house (which typically shows the focus of human occupation at one end of the building, the rest being given over to the animals). There is, in general, a contrast between these structural types that must reflect divergencies in social organization. The rectilinear long-house was designed to accommodate a group of farmers and its stock under a single roof, and was so constructed that expansion of the group or its herd could be met by longitudinal extension of the building. The boat-shaped house, on the other hand, appears generally to have been a dwelling for humans alone, and is suggestive of a system in which expansion of a family or other group more readily gave rise to a multiplication of households.

It was as a barrack-block, however, that the boat-shaped house was most impressively exploited, within the great Viking fortresses of Trelleborg, Aggersborg and Fyrkat (tenth–eleventh centuries A.D.).[1] Trelleborg, the most fully investigated and published of these sites,[2] furnishes good instances of the features that have been remarked above: palisade-type walls, set in continuous foundation-slots (though these were punctuated by regular series of localized deepenings for the reception of every other post), and division of the interiors into three parts.[3] The houses at Aggersborg and Fyrkat rested in separate post-holes, with some interesting variations in constructional detail.

[1] See generalized references and bibliographies in J. Brøndsted, *The Vikings* (Penguin Books, 1960), in the same author's *Danmarks Oldtid*, III (Copenhagen, 1960), and in H. Arbman, *The Vikings* (Thames and Hudson, 1961).

[2] P. Nørlund, *Trelleborg* (Copenhagen, 1948).

[3] In addition, it should be noted that in the Trelleborg houses, and some kindred structures elsewhere, the doors in the side-walls are set at some distance from the mid-point. The writer is thereby further encouraged to suggest that the concentration of burned clay and wood at the north wall of the Buckden house represents a doorway (see p. 15).

Until recently the reinvention of the boat-shaped house was ascribed to the Vikings. Now, however, discoveries of kindred buildings some centuries older than the Viking examples have removed the basis of that assumption. The earliest of the structures in question has been found at Hodde (Ribe, Denmark)[1] as the result of aerial reconnaissance. Trial excavation, on a small scale, has produced evidence that suggests that this, a three-aisled building with curved side-walls founded in slots, is to be dated to the earlier part of the Roman Iron Age or even to the end of the pre-Roman Iron Age. Another house with curved side-walls, based in separate post-holes and with probably two pairs of roof-posts dividing the interior into three parts, has been excavated at Traelborg (Ribe, Denmark)[2] and is dated to the period 400–600 A.D. Similar houses, ascribed to the eighth century, were found to underlie the larger and more sophisticated buildings of the Viking fortress at Aggersborg. A building in several respects analogous to the Buckden house has been disclosed by excavations at Lindholm Høje (Aalborg, Denmark):[3] a house, based partly in long slots and partly in separate post-holes, which is referred with probability to the eighth or ninth century. The parallel is not a precise one, for the Lindholm structure has regular series of auxiliary posts outside the walls, is divided into three aisles by two longitudinal rows of roof-posts, and certainly was without ground-sills; but in size, proportion and general character there is a family resemblance. A point of special interest is that this building was found to have superseded a house of rectilinear plan.

Some houses of the later pre-Roman Iron Age and early Roman Iron Age excavated in Jutland[4] attain maximum width only in their middle sections and thus, tapering very slightly towards their ends, the side-walls present an unemphatic, angular bulge. Among the same structures there are instances of palisade-type walls and the use of continuous foundation-slots, and in general these are houses of no great length, relative to width; so that overall they might be thought to offer a hypothetical link between the normal rectilinear house and the form with curved sides.

In roughly the same period and later, buildings with side-walls more or less curved were not uncommon in Sweden and Norway; but for the most part they were walled with stone rubble and turf, and their relevance is the less immediate. Two recent discoveries in those countries must be mentioned, however: a boat-shaped building of the sixth century at Stord, to the south of Bergen, Norway,[5] in which continuous slots housed wooden walls externally reinforced with banks of earth and rubble; and similar buildings on the island of Helgö, Uppland, Sweden,[6] dated to the same or

[1] J. Brøndsted, *Danmarks Oldtid*, III (Copenhagen, 1960), p. 395.

[2] *Ibid.* pp. 283–4.

[3] T. Ramskou in *Acta Archaeologica*, XXVIII (1957), fig. 12.

[4] E.g. those at Nørre Fjand, in Jutland: G. Hatt, 'Nørre Fjand', *Arkæol. Kunsthist. Skr. Dan. Vid. Selsk.* 2, no. 2 (1957).

[5] E. Hinsch, *Naust og Hall i Jernalderen*, Årbok for Universitetet i Bergen, Humanistisk Serie (1960), no. 2.

[6] As yet unpublished. The writer visited the site in 1960 and discussed these buildings with Mrs B. Arrhenius. The slots had been thought possibly to represent internal drains, but Mrs Arrhenius acknowledged the likelihood of the suggestion that they carried an inner facing of vertical planks.

a slightly later period. These instances remind us of the possibility that outside the wooden walls of the Buckden house there were originally earthen banks, since removed by ploughing.

Outside Scandinavia, boat-shaped houses of the eighth or early ninth century have been found at Warendorf in Westphalia[1]—where, as at Lindholm, they are shown to have succeeded rectilinear buildings.

It will be apparent from the foregoing that the evidence at present available points to Scandinavia as the centre of the boat-shaped building's later development; and it suggests moreover that the appearance of the form in other regions is possibly to be attributed to Scandinavian influences. With this in mind it appears curiously appropriate that the only two well-authenticated examples known in England—the Buckden house itself and an 'apparently boat-shaped' building at Thetford,[2] based in separate post-holes—should both occur in the area of Scandinavian settlement and both fall within the period ninth–eleventh centuries;[3] but no serious attempt can be made to judge the situation until a substantially greater number of instances is available.[4]

Mr Tebbutt's suggestion that the Buckden house stood on a ground-sill is perfectly consistent with such Scandinavian connections as are suggested, despite the fact that it would in that case appear to be the only known example of a boat-shaped building of its period so constructed; for there is good evidence of the use of ground-sills within the Scandinavian *milieu* from at latest the eleventh century onward.[5] Further, such positive and negative evidence as is available from this country strongly suggests that the ground-sill came into favour in the century preceding the Norman conquest.[6] Possibly it was reintroduced to England from the Continent, for it makes no appearance among the known Anglo-Saxon buildings dated within the period fifth–ninth centuries. For example, it has been shown that

[1] W. Winkelmann, in *Neue Ausgrabungen in Deutschland* (Berlin, 1958), pp. 492–517.

[2] G. Knocker and R. G. Hughes in *Archaeological News Letter* (January 1950), p. 119.

[3] Among the house-shaped stone monuments of northern England there are numerous examples, referable to the period in question, with curved sides and 'ridge'—hence the name 'hog-back' usually applied to the whole class. The writer will shortly publish a definitive study which leads to the conclusion that this is not itself a Scandinavian type of monument, as sometimes has been alleged, but that it is an insular development. Thus, the truly hog-backed examples must mark a response to 'boat-shaped' houses actually standing in or near the dominant centres of production in north Yorkshire.

[4] Since this was written a wooden hall with tapered ends, based on series of upright posts set in a shallow trench, has been disclosed on a documented site of royal residence at Cheddar, Somerset. This building, the maximum dimensions of which are 78 × 18 feet, is dated by its excavator, Mr P. Rahtz, to the ninth or early tenth century (before 930). The writer gratefully acknowledges Mr Rahtz's kind permission for inclusion of this further instance.

In addition, the slight curvature of the walls of Westminster Hall, built for William Rufus, should be noted. This feature was originally brought to the writer's attention by Mr H. M. Colvin.

[5] E.g. in the later Viking trading-centres. Good instances from Hedeby and Sigtuna are shown in M. Rudolph, *Germanischer Holzbau der Wikingerzeit* (Neumünster, 1942), Abb. 119–Abb. 122 incl. Mature exploitation of this device is seen in early stave-churches (e.g. Urnes and Hemse: see E. Ekhoff, *Svenska Stavkyrkor* (Stockholm, 1914–16), pp. 30–65, 79–128).

[6] The building of what appears to have been a sill-based house is described in the early eleventh century by Byrhtferth (*Byrhtferth's Manual*, E.E.T.S. 177 (1929), p. 142, conveniently cited by M. W. Thompson in *Arch. J.* CXIV (1957), p. 80).

the seventh-century buildings at Yeavering, Northumberland,[1] a series of later halls at Old Windsor, Berks.,[2] and the original structure of the church at Greensted, Essex,[3] all with timber walls set into foundation-trenches, were built without ground-sills. Ground-sills appear for the first time at Greensted in a secondary structural phase; at Old Windsor in the tenth or eleventh century, and probably in the same period at Thetford.

It should be remarked that the two examples of rectilinear houses based on ground-sills found at Old Windsor both resembled the Buckden house in that their end-walls were not indicated by beam-slots. There, it is most probable that the end-walls rested on transverse beams laid on top of the longitudinal timbers, secured by some form of half-jointing or dowelling, as in some Scandinavian stave-churches. The upper beams in that case need not have been set into the ground at all, and it is improbable that any archaeological trace of them would remain. The same explanation might well apply to the Buckden house, for the significance of the post-holes at its east and west ends remains doubtful. They appear from the plan (p. 14) to run in series, with northern and southern arms extending for some distance along the outsides of the wall-slots; from which it seems that they are more likely to represent external, ancillary features than the actual structures of the gable walls themselves. If so, the absence of truly structural indications at the gable ends increases the probability that the building as a whole was founded on ground-sills.

That and other constructional problems can be solved only in the light of a multiplication of instances, and, now that Mr Tebbutt has shown the way, it is to be hoped and expected that further discoveries of this and kindred types of house will soon be made in Britain.

Meanwhile, it can be said that the structure of the Buckden house is wholly consistent with the evidence of the associated pottery, which shows its occupation to have come to an end during the second half of the eleventh century. While the date of its construction cannot be determined with any certainty, a pre-Conquest origin seems extremely probable. The building's lifetime is unlikely to have exceeded fifty years, and that span is most reasonably set somewhere within the period 1000–1100.

In congratulating Mr Tebbutt on this important new discovery, the writer adds his warmest thanks for the generosity which allowed this broad and tentative review to proceed from it.

[1] B. Hope-Taylor in *Medieval Arch.* I (1957), pp. 148–9 (summary account). Definitive account to be published as one of the series of Ministry of Works Research Monographs.

[2] B. Hope-Taylor in *Medieval Arch.* II (1958), pp. 183–5 (summary account). Definitive account to be published as one of the Ministry of Works Research Monographs.

[3] Excavated by O. Olsen, H. Christie and the writer in 1960. A full account is now in preparation.

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