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Reviewed Article:

The Butser Ancient Farm Horton Neolithic Building – Its Construction and Significance to the Interpretation of Buildings of Early Neolithic Britain and Ireland

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In 2019 a substantial building, based on archaeological evidence of early British Neolithic dwelllings, was constructed by site staff, volunteers, and staff of Wessex Archaeology at the Experimental Archaeology site, Butser Ancient Farm in Hampshire, England. The

archaeological feature on which our building was based was excavated in 2012 by Wessex Archaeology as part of a pre-extraction programme of investigation at the Kingsmead Quarry, Horton, in Berkshire England. Structures with very similar ground plans have also been recorded in Ireland. Such specific morphological similarities, their sudden appearance and disappearance over a very narrow chronology suggests a 'type', of unusual form and unknown origin. This article explores issues that were faced during the design and construction of the building and the light those issues shed upon the peculiarities of these structures. This paper seeks to question the straightforward interpretation of this class of building 'simply' as a 'house' and explores, tentatively, alternate interpretations of structure and usage.

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Introduction

During 2019, a substantial building based on archaeological evidence from Britain's Early Neolithic period was constructed by site staff, volunteers, and staff members of Wessex Archaeology at the Experimental Archaeology site, Butser Ancient Farm in Hampshire, England. The archaeology presented a slightly bow-sided rectangle of trenched foundations. The excavators observed that the archaeology bore a striking resemblance to another Early Neolithic house found during the 2008 excavations at the same site (Chaffey, Creighton and Walton, 2020, pp. 32 – 39; Creighton and Walton, 2020; Walton, 2021, pp. 38 - 45). Structures of comparable ground plan have also been recorded in Ireland. These structures appear to belong to the first third of the Irish and British Neolithic (ca. 39th – 37th Centuries BCE) with, it appears, no exact parallels in construction antecedent to this period.

Drawing upon insights into the engineering of the experimental building created at Butser, this paper argues that these structures should be considered as a type, whose common features render them distinct from others of comparable date within the Anglo-Irish Neolithic. The paper also questions the interpretation of this class of building as houses in the conventional sense. It explores, briefly, the potential for drawing contrasts and comparisons with Western European structures of comparable, as well as earlier, chronologies and offers tentative alternate interpretations of structural engineering and usage.

The Archaeology

The archaeology on which the Butser Ancient Farm experimental building is based was excavated in 2012 by Wessex Archaeology as part of a pre-extraction programme of investigation at the Kingsmead Quarry, Horton, in Berkshire England (Wessex Archaeology 2013).

The archaeology presented as a slightly bow-sided rectangle of trenched foundations, filled with dark organic material that contrasted well against the natural (See Figure 1). In the excavator's report the structure was identified as 'House 34500' and is characterised in this paper as 'Horton 2' (Wessex Archaeology 2013, p.12.). The associated pottery indicated an Early Neolithic date *of* 3750 BCE (Wessex Archaeology, 2013, p. 31; Wessex Archaeology, n.d.). The structure was loosely rectangular in plan and contained an internal partition dividing it into two rooms/cells. The house is thought to have been constructed of upright posts or planks placed in foundation trenches' (Wessex Archaeology 2013, p. x). Its breadth varied between 6.1 to 7.7 metres, with a length of 15.06 metres. A pair of discontinuities in the foundation trenches at the southeastern corner of the archaeology, approximately 1 metre wide and separated by a feature suggestive of a timber partition also about 1 metre wide, were interpreted as doorways (See Figures 1 and 6). The excavators also observed that the archaeology 'bore a striking resemblance to the Early Neolithic house found during the 2008 excavations' at the same site (Wessex Archaeology 2013, p. x).

Structures of comparable ground plan have also been recorded in Ireland. Sites at which structures that exhibit morphological similarities to the Horton 2 archaeology have been excavated include numerous Irish examples, such as Mullaghbuoy, Ballintaggart, Dunsinane (See Figure 2), Ballygally, Ballyharry, Russelstown, Kishoge, Ballysaxhills and Drumenny (Smyth, 2013; Smyth and O'Flaherty, 2015). It is possible that a large Neolithic structure excavated in 2021 at Clooney Road, outside Derry City, by Northern Archaeology Consultancy is yet another example of the type, but the report has not been published at the time of writing (McMonagle, 2023, pers. com.). In all cases, the structures are dated to the first third of the Irish and British Neolithic (ca. 3900 – 3600 BCE). There appear to be no exact parallels in construction antecedent to or after this period. In the case of both Horton structures, and a number of those from Ireland, distinctive projections are in evidence at either, or in some cases perhaps both, ends. These take the form of continuations of the trench foundations of the longer sides beyond their intersections with the foundations of the shorter sides (See Figures 1 and 6). Breaks in wall trenches along one or other of the long axes, generally interpreted as entrances, are also often apparent in the archaeology (Smyth and O'Flaherty 2015, pp. 13 – 14). The archaeology of these structures also exhibits substantial slot trenches that extend into the interior spaces from the mid points of the long axis foundation trenches. These form what appear to be dividing walls at the centres of the structures (See Figures 1, 2 and 6). In each case these putative internal dividing walls are discontinuous, with a break in their centres, presumably to allow access to both ends of the structures. Such specific morphological similarities are suggestive of a 'type', and one of unusual form and dimension

for the period. For the purpose of this paper, the archaeology of comparable structures will be referred to as 'Horton Types'.

Building the 'Horton 2 House' at Butser Ancient Farm

Engineering a buildable, full-scale structure from the evidence of the Horton 2 archaeology proved challenging for my colleague, Claire Walton, myself, and other collaborators. The process of building any valid experimental structure requires that it must be constructed entirely with materials and tools known to have been available to the original builders, which limited our choices of materials, construction techniques, and fixings. Although it is not a precondition (structural failure may be a valuable experimental outcome), it was desirable that the building was both structurally sound and durable. Our reasoned assumption was that such a substantial structure repeated at other locations, could reasonably be expected to have stood for some time. In addition, it was planned that the finished structure become a part of the Farm's educational offering, thereby necessitating the provision of a safe building for the engagement of our visitors.

The large scale of the building, particularly its breadth, presented the greatest challenge to the engineering and building of a sound structure. Even assuming, as we did, that a roof could be supported by an arrangement of rafters spanning the short axis, the ca. 7m width is a significant void to be bridged without internal supports. Furthermore, a building on such a scale can be expected to have a relatively heavy roof. While evidence exists for relatively advanced carpentry skills in the Neolithic (Tegel *et al.,* 2012), the known types of Neolithic jointing are not optimal for structures spanning large, unsupported voids. The problem of spanning interior spaces within large Neolithic structures with relatively few internal posts had also been noted by Roy Loveday, in reference to Northern British examples (2020). Similar issues complicated efforts to construct a building based on comparable archaeology at the Irish National Heritage Park in 2015 (Smyth and O'Flaherty, 2015, pp. 13 – 14; Smyth, pers. com., 2019).

The much more numerous large structures of the Continental European Neolithic, such as those of the *Linearbandkeramic* cultures, are typically characterised by numerous posts set within their interior spaces. A very convincing interpretation of these features is that the many posts (or a large proportion of them) were necessary for holding up a roof that had been constructed with very simple jointing and fastening techniques (Coudart, 2013). The same logic can be applied to the structural engineering of the large Scottish structures of the Early Neolithic, such as those at Claish (Sheridan, 2013, pp. 289 - 290) and Balbridie (Last, 2013, pp. 273 - 274).

The solution developed at Butser Ancient Farm was to eliminate structural walls and employing instead an A-frame construction with five principal earth-fast rafters, each pair braced by an elevated tie-beam (See Figure 5). The principal rafters are distributed

equidistantly along the long axis of the building and support the entire roof load. All structural timbers were of commercially sourced Scots Pine (*Pinus sylvestris* – a species known from the British Neolithic), and the fastening of the structural elements was achieved with a combination of very simple lap joints, in some cases halved, with pegging and/or lashing, using commercially sourced rope. All fastening systems are achievable using Neolithic technologies (albeit with hand-made cordage or similar substituted for commercially sourced ropes), as we demonstrated with proof-of-concept construction of the first A-frame employing reproduction Neolithic tools (See Figure 3). The entire structure was assembled using only human power and rudimentary levers as lifting aids.

Two rows of horizontal purlins (created using multiple ca. 5m poles lashed end to end to create a continuous length) were fixed to the load-bearing principal rafters along both sides of the long axis of the structure. One row was fastened approximately 1m from the ground, another at approximately 3m. The purlins carried paired common rafters, set approximately 1m apart along the long axis of the building (See Figure 4). Hazel rods, running laterally, were lashed to the common rafters and acted as battens to which water reed thatch was attached using lashed twine (See Figures 3, 4 and 5).

The ground plan of the archaeology was followed rigorously. A non-structural plank wall was set into the earth at the eastern end of the building and a sill beam inserted at the western end to carry a wattle and daub wall. This wall and sill beam acknowledged the evidence of timber-filled trenches in the archaeology. For similar reasons, a low, non-structural horizontal timber slab wall was set in trenched foundations along the long sides. The angled 45o pitched roof, which has an average height of a little over five metres, was thatched with water reed, bringing the unsupported mass of the roof to approximately 10 tonnes. Water reed was selected as the roofing material on the basis of the wetland setting of the original building.

A series of earth-fast poles were attached laterally to the principal rafters, at a height of approximately 1 metre and an angle of 45o and set within the ground to act as lateral bracing (See Figure 4).

Elevated tie beams spanned the internal void, secured at each of their ends to the five principal rafters. The tie beams at either end of the structure were supported by a pair of upright, earth-fast posts. A similar configuration was employed in the centre of the building, at the terminal points of the innermost ends of what had been identified in the archaeology as the central dividing trenches (See Figure 5). Discussions with the excavating archaeologists concluded that posts may have been present at these points in the archaeology (as they are in some Irish examples. See Smyth 2013, p. 304), although this is a tentative suggestion (Chaffey, 2019, pers. com.). A pair of partial dividing walls were set within the building, mirroring the archaeology, which in our interpretation are non-load-bearing partitions. They

are only around 1 metre in height and serve to structure space, rather than to provide structural support for the building.

Observations

It is inevitable that experimental constructions based on the interpretation of archaeology are only ever a partially satisfactory representation of what the original actually was (Reynolds, 1979, pp. 29 - 30). In the case of our construction of the Horton 2 structure, we are aware of a few shortcomings, vis-à-vis its conformity to the structural evidence in the archaeology. While our structure remains a *plausible* interpretation of the archaeology (See Figure 6), the use of an A-frame construction is not directly supported by any evidence in the archaeology of earth-fast raked posts.

Furthermore, neither the single wall of vertical planks nor the sill-beams in our structure address substantively the identification of deep foundation trenches (up to one metre) or the potential for a structural role for vertical planking (Wessex Archaeology 2013, p.x.). The team from Wessex Archaeology proposed an alternative design in a virtual model (Wessex Archaeology n.d.), which featured vertically planked walls. However, the creators recognised the same problem that we had encountered. That is, a simple plank wall would likely be insufficient for supporting a heavy roof across such a large span. Their assumption was that there had been many more postholes in the original foundation trenches than had been identified in the archaeology, any evidence for which had been eliminated by truncation and/or unfavourable taphonomic conditions.

Neither conclusion is entirely satisfactory in addressing the problems posed by the archaeology, in that both rely on assumptions that are not directly supported by excavated evidence. While it must be noted that many of the structures of the Horton Type are not as large as Horton 2, and therefore do not present the same structural challenges, the key point is that they conform closely to the same ground plan, so can be assumed to have some structural relationship to the larger structures, and it is the challenges in engineering the largest of the structures that must be addressed in order to better understand the nature of the Type.

There are other possible structural interpretations of the archaeology. For example, the walls may have been of palisade form, using substantial timbers such as halved trunks, set vertically in the ground (Smyth and O'Flaherty 2015, p 14.). Such a design would provide a better fit with what is seen in the archaeology than either the post and plank wall of the Wessex Archaeology virtual reconstruction (Wessex Archaeology n.d.) or the A-frame structure we have constructed at Butser Ancient Farm. However, if we again assume an absence of complex jointing in Neolithic carpentry, the question remains as to whether this method of walling is adequate to prevent the spreading and/or racking to which insufficiently secured and braced roofs are prone. It can be argued that the use of a continuous wall plate

on a robust palisade wall would significantly reduce the likelihood of wall spread. However, based upon our existing understanding of Neolithic carpentry, the relative difficulty of engineering such a feature renders it fairly unlikely. Nevertheless, that possibility cannot be discounted, nor can the possibility that Neolithic builders used sophisticated jointing in roof construction for which no evidence has yet been identified.

Another interpretation of the structure is that the massive timber walls were revetments against which earth banks were packed. This idea is lent support in Roy Loveday's paper, 'Where Have all the Neolithic Houses Gone: Turf - an Invisible Component?' (2006). Intriguingly, the assumption of a revetment wall offers a potential structural interpretation for the characteristic 'horns' that extend from the long axis wall trenches beyond the end walls in the Horton 2 archaeology and others of the Type (See Figures 1 and 2). It is conceivable that these wall extensions may have aided soil retention, therefore enhancing structural bracing at the corners of the building.

The possibility that the original structures may not have been roofed at all cannot be ignored. Horton Type structures may have been enclosures, rather than 'houses' as such. There was no direct evidence of a hearth in the Horton 2 archaeology and very little evidence for domestic activity of any kind (Wessex Archaeology 2013, p 12). This bolsters somewhat the argument that the structure was not a domestic setting. However, this absence may well have been due to truncation and/or taphonomic conditions, a contention bolstered by the excavators' suggestion that elevated magnetic susceptibility readings in the southeastern 'entranceway' may be indirect evidence of 'a hearth' within the structure (Wessex Archaeology 2013, p 12). In any event, a single example cannot be considered adequate for inferring a general case, but further research into the evidence, or lack thereof, for domestic use within other structures of this Type would be valuable in efforts to determine their nature and function/s.

While detailed discussion of possible use/s for any postulated enclosure structures of Horton Type is beyond the scope of this paper, it is worthwhile noting that although the absence of elevated phosphate levels in the soil within the Horton 2 structure suggests, *prima facie,* that use as an animal or burial enclosure is unlikely, the excavators attributed this to site truncation (Wessex Archaeology, 2013, p 66), so neither option can be dismissed (Aden Country Park Neolithic Site, n.d.; Brophy, 2007, p. 29; Last, 2013, p 277; Loveday, 2020).

Possible Continental Comparisons

As is the general case with British and Irish Neolithic houses, it is not possible to identify any direct precursor to Horton Type architecture in Continental examples (Last, 2013, pp. 261 – 282; Sheridan, 2013, pp. 283 - 284). Although *Linearbandkeramic* long houses do sometimes feature vertically planked walls set within trenched foundations, this is where any similarity ends (Bradley, 2001, pp. 50-56). Their dimensions, structural features, and chronologies are

too radically different to consider *Linearbandkeramic* houses as direct progenitors of the Horton Type structures. The same can be said of most known, later Continental building types, such as those of the *Rössenkultur.* This point is particularly important, as a superficial comparison of the exterior of the Butser Ancient Farm Horton House with the superb experimental *Rössenkultur* longhouse at Zeiteninsel in Germany might suggest that these two buildings are structurally similar. This is not the case, as the Zeiteninsel building is a post-built structure, with its roof supported by earth-fast aisled posts arrayed along the long axis of the building's interior (Geschwind, pers. com., 2023). And while the substantial trenched foundations and few internal posts of the Horton Type are echoed in the archaeology of the *Brześć Kulawski Culture* houses of Poland (Pyzel, 2013, pp 186 – 196), the distinctive wedge shape of the latter renders any direct linkage between the two types unlikely.

Of greater potential interest among European examples are the longhouses of Mairy in France and Flogeln in Germany (Last, 2013, pp. 272 - 274). Although the architecture of these structures differs considerably from that of the Horton Type (as well as from each other), the evidence of trenched foundations, vertically planked perimeter walls and division of internal spaces by partial internal walls' is suggestive of construction techniques and structuring of space which have parallels in the Horton Type archaeology. To an extent, the same may be said of Balbridie in Scotland (Last, 2013, pp. 272 - 274).

Conclusion

Despite the shortcomings identified in the Horton 2 building at Butser Ancient Farm, it cannot be seen in any way as a 'failure'. It has achieved precisely what experimental structures should – to present a possible solution *and* to ask questions of interpretation. The same certainly holds true for the structural proposals of both Wessex Archaeology and the Irish National Heritage Park. The issues of construction that we have faced highlights the problems inherent in identifying the nature of a structure from the archaeology and have prompted the writing of this paper.

The repetition of the Horton Type ground plan at multiple sites across Britain and Ireland, the chronologies of which are restricted to a relatively short period spanning approximately 3900 – 3600 BCE, raises questions about how the Type arose, apparently without obvious precursors, and why it disappeared so rapidly (Smyth and O'Flaherty, 2015, p. 14). The original Horton 2 foundations are quite massive and suggest that the structure was conspicuous in its consumption of walling materials, a pattern that appears common to other buildings of the Type, for example at Dunsinane (See Figure 2).

The archaeological evidence from Horton and the other comparable sites suggests strongly that they are representative of an intriguing class of structures that may or may not have been 'houses' in the domestic sense. The repetition of a specific, idiosyncratic form further suggests that the Type derives from a building tradition associated with a specific group of

people, and which may have embodied meaning/s that transcended a purely functionalist use (Smyth and O'Flaherty, 2015, p 14). It is beyond the scope of this examination to explore further the possible implications of the shared characteristics of the Horton Type structures, but it is hoped that in highlighting them this paper has provided points of departure for further study.

Keywords (re)construction
archaeological open-air museum

Country United Kingdom

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FIG 1. THE HORTON 2 ARCHAEOLOGY DURING EXCAVATION. PHOTOGRAPH COURTESY OF WESSEX ARCHAEOLOGY.

FIG 2. DUNSINANE IRELAND. USED WITH KIND PERMISSION OF TVAS LTD. IRELAND.

FIG 3. FASTENING AND JOINTING IN THE HORTON 2 HOUSE AT BUTSER ANCIENT FARM. PHOTO BY TREVOR CREIGHTON 2019.

FIG 4. NEAR COMPLETE FRAME OF THE HORTON 2 HOUSE AT BUTSER ANCIENT FARM. PHOTO BY TREVOR CREIGHTON 2019.

FIG 5. INTERIOR OF HORTON 2 NEOLITHIC HOUSE AT BUTSER ANCIENT FARM LOOKING WEST. UNDER CONSTRUCTION, SHOWING CENTRAL, UPRIGHT INTERNAL POSTS IN CENTRE OF BUILDING AND AT THE WESTERN END. PHOTO BY TREVOR CREIGHTON 2019.

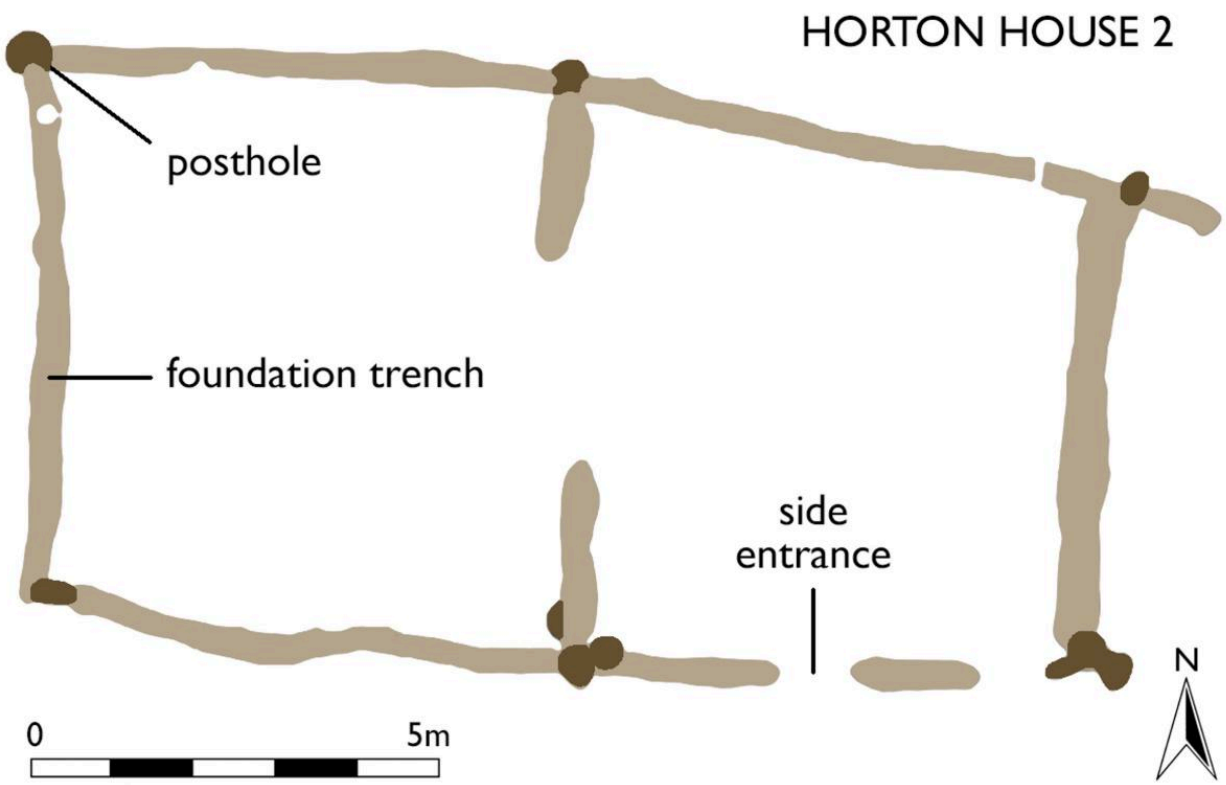

FIG 6. SCHEMATIC PLAN OF HORTON 2 ARCHAEOLOGY. IMAGE COURTESY OF WESSEX ARCHAEOLOGY.