

PART 3

Spatial Patterning

'A moment's reflection will suggest that casual debris may be expected to extend some distance beyond the limits of the area actually occupied and the question arises how exactly this can be defined. In practice this is less troublesome than theory would suggest, since the density of worked flints declines sufficiently steeply to define the knapping area tolerably clearly.'

(Clark 1954, 5)



CHAPTER 5

Dryland Structures

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Introduction

Despite originally interpreting the site as a residential camp, Clark did not locate any structures such as huts or tents during his excavations. Though Clark suggested that this absence may have been due to taphonomy (Clark 1954, 9), we now know that the area he excavated would have been at least periodically submerged during the time the site was inhabited, making it unsuitable for most forms of built structure (Chapter 19).

It was not until the excavation of larger areas on what would have been the Mesolithic dryland that evidence for structures (in the form of cut features such as postholes) was recorded. When first observed in plan the features were somewhat ephemeral with slightly indistinct edges, probably resulting from bioturbation (such as worm or root action) mixing the fills of the features with the surrounding sediment, and gleying (see Chapter 20). However, once an area was cleaned and left to weather the features became more distinct, and upon excavation they turned out to be well defined, with a clear distinction between the edges of the cut and the surrounding deposit. Though some of the features were quite shallow it is unlikely that these have been truncated through later action given that the dryland parts of the site would have been buried beneath peat by the end of the Early Mesolithic.

The first structure was recorded in 2008, during the excavation of trench SC23, and consisted of a small hollow surrounded by postholes (the eastern structure) just beyond the extent of the Early Mesolithic lake shore. In the following years, two further concentrations of cut features were uncovered within the main part of trench SC34: a small concentration of possible postholes, known as the western structure, and a more complex arrangement of postholes and an associated hollow, known as the central and northern structures. Together, these features represent the earliest evidence for built structures in Britain and demonstrate a level of permanence in terms of the human occupation of this landscape that contrasts with traditional views of Early Mesolithic society (Conneller et al. 2012).

The western structure

The western structure is made up of a concentration of small features that were recorded at the western side of trench SC34, just to the north of trench SC24 (features [313], [505], [507], [508], [512], [513], [514], [515], and

Figure 5 (page 55): Aerial photograph of SC34 in 2014 (Copyright Sue Storey, CC BY-NC 4.0).

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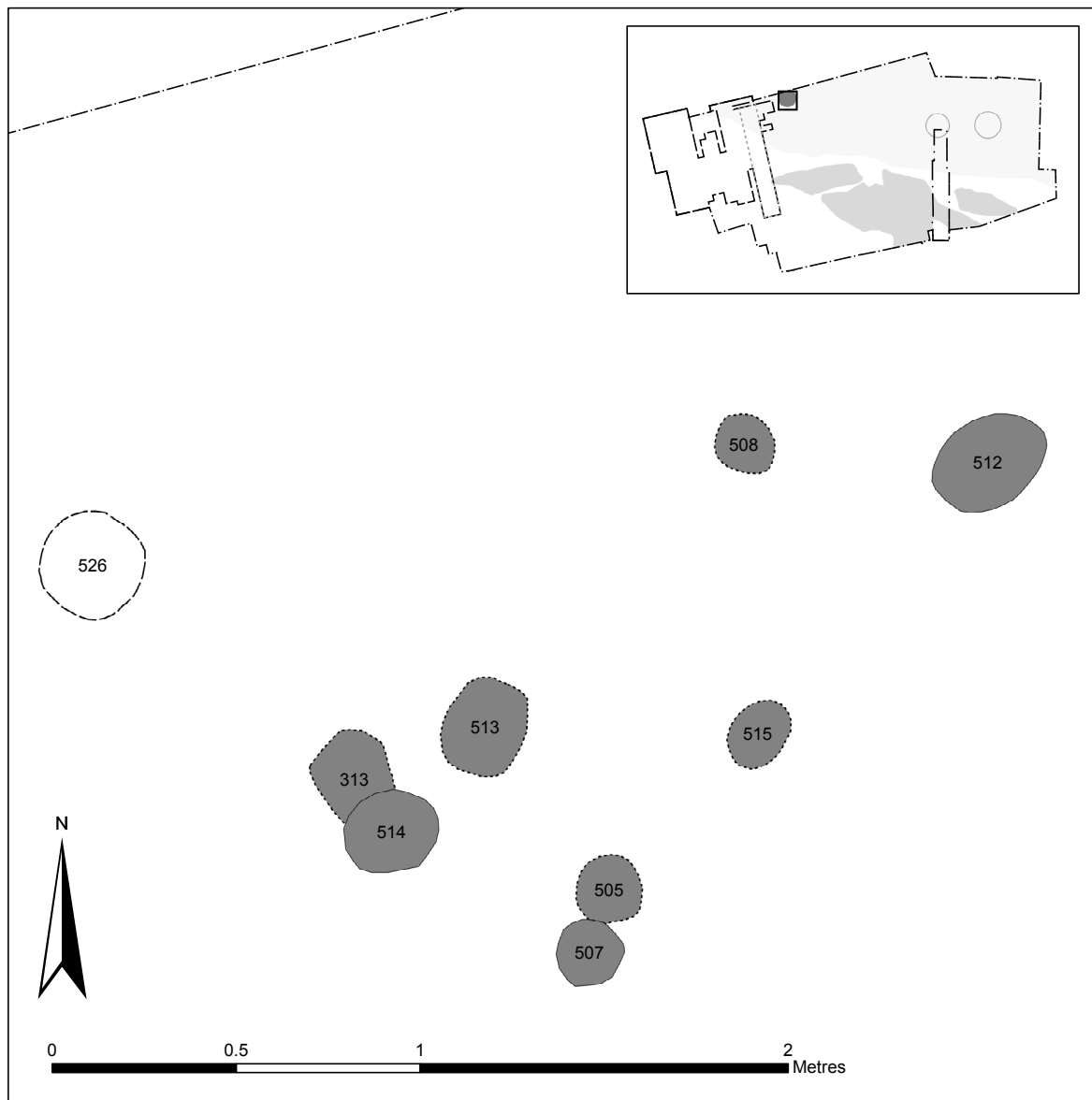


Figure 5.1: Plan and profile of the features comprising the western dryland structure (Copyright Star Carr Project, CC BY-NC 4.0).

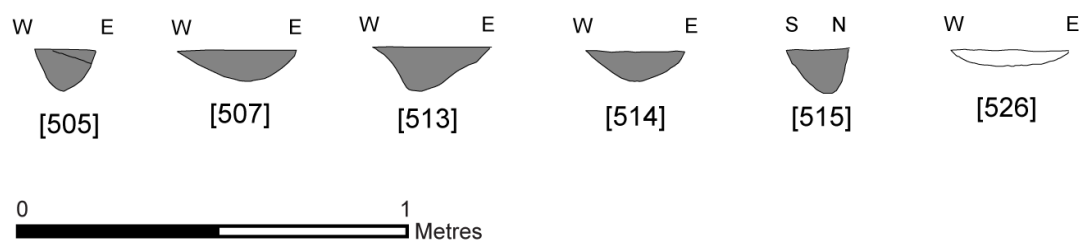


Figure 5.2: Profiles of the features comprising the western dryland structure (features [313], [508] and [512] were excavated in plan, and there is no drawn profile) (Copyright Star Carr Project, CC BY-NC 4.0).

[526]) (Figures 5.1 and 5.2). This was an area of mottled gleyed clay that had been disturbed by root action, making identification of features difficult. All of the recorded features are round or subround and have a similar diameter. Features [512] and [514] were considered by the excavator, CC, to be postholes. In addition, features [313], [505], [507], [508], [513] and [515] have steep sloping sides and a rounded base and could also be interpreted as potential postholes on the basis of the shape, size and profile (though the sides of [508] are less regular than the others). From its morphology, feature [505] probably held an upright post. Similarly, features [513] and [515] could potentially have held angled posts (approximately angled towards the east and west respectively) given the sloping aspect of one side of the profile, though this could be due to later disturbance of the sides of the feature. Feature [526] has a more gently sloping, bowl-like profile and could be interpreted either as a posthole or small pit.

The western structure lies near the centre of a dense concentration of worked flint, much of which is burnt. This extends c. 2 m from the footprint of the features before the lithic densities drop off (see Chapter 8, Figure 8.3). If the features are contemporary with the flint then it is unlikely that they supported an external wall, as this would be expected to have limited the spread of material. However, they could be the internal supports for a larger structure, the external edge of which is marked by the main concentration of flint. Alternatively, the postholes may not have been part of a walled building, but instead are the remains of another form of structure or structures, such as a raised storage area, or drying racks. Given the nature of the lithic assemblage, this may be an abandoned structure that has subsequently been used as a midden (see Chapter 8).

The central area

Overview

A more extensive and complex arrangement of features was recorded towards the central part of trench SC34 (Figure 5.3). Two potential structures are represented by these features: an arrangement of possible postholes around a shallow hollow (the central structure) and an arc of possible postholes just to the north (the northern structure). Unfortunately, the eastern half of the central structure was truncated by trenches VP85A and SC23 and not detected in either excavation, whilst the northern structure may have been truncated by Pit 1 (excavated in 1989), and possibly also by SC23. Scatters of potential pits and postholes were also recorded in the area to the west of both structures, some of which may have formed part of additional structural arrangements.

The central dryland structure

The central structure consists of a shallow hollow with an associated arrangement of postholes around its outer edge (Figures 5.3 and 5.4). The hollow [330] measures 3320 mm north-south and is 180 mm deep and, assuming it had a regular shape, was at least 2650 mm wide. The hollow had two fills: an upper fill made up of a dark brown sandy silt with gravel inclusions (context 325) and a lower fill which was a similar sediment but with less gravel (context 331). The hollow had been truncated on its eastern side by the excavation of VP85A and trench SC23, the base of the feature surviving a short distance within the area of these earlier excavations.

Six small, round or subround features were present along the western side of the hollow (features [338], [340], [342], [382], [348] and [332]) and have been interpreted as forming part of the same structure based on this spatial association. These features have a similar circular or oval shape in plan and rounded, bowl-like profiles (though some have slightly steeper sides or flatter bases). The exception is feature [342], which has a more irregular shape in plan, though this was due to disturbance on its north-east side. An additional feature, [350], which is very similar in size and shape, may also form part of this arrangement.

Two further features ([386] and [380]) lie slightly further away from the edge of the hollow, and could potentially form part of a second arrangement of features. Of these, feature [380] has fairly steep sides and a flat base, and could potentially have acted as a posthole, probably holding a post vertically. A single, shallow feature was also recorded at the base of the hollow [414]. The feature was a regular rounded shape, with sloping sides and a rounded base and filled with the same deposit as the hollow. It is not possible from the shape or profile of the feature to suggest the function.

Unfortunately we can say very little about this structure in terms of its architecture, as all of the associated features are too shallow to provide any clear indication of their function. However, the geochemical analysis has

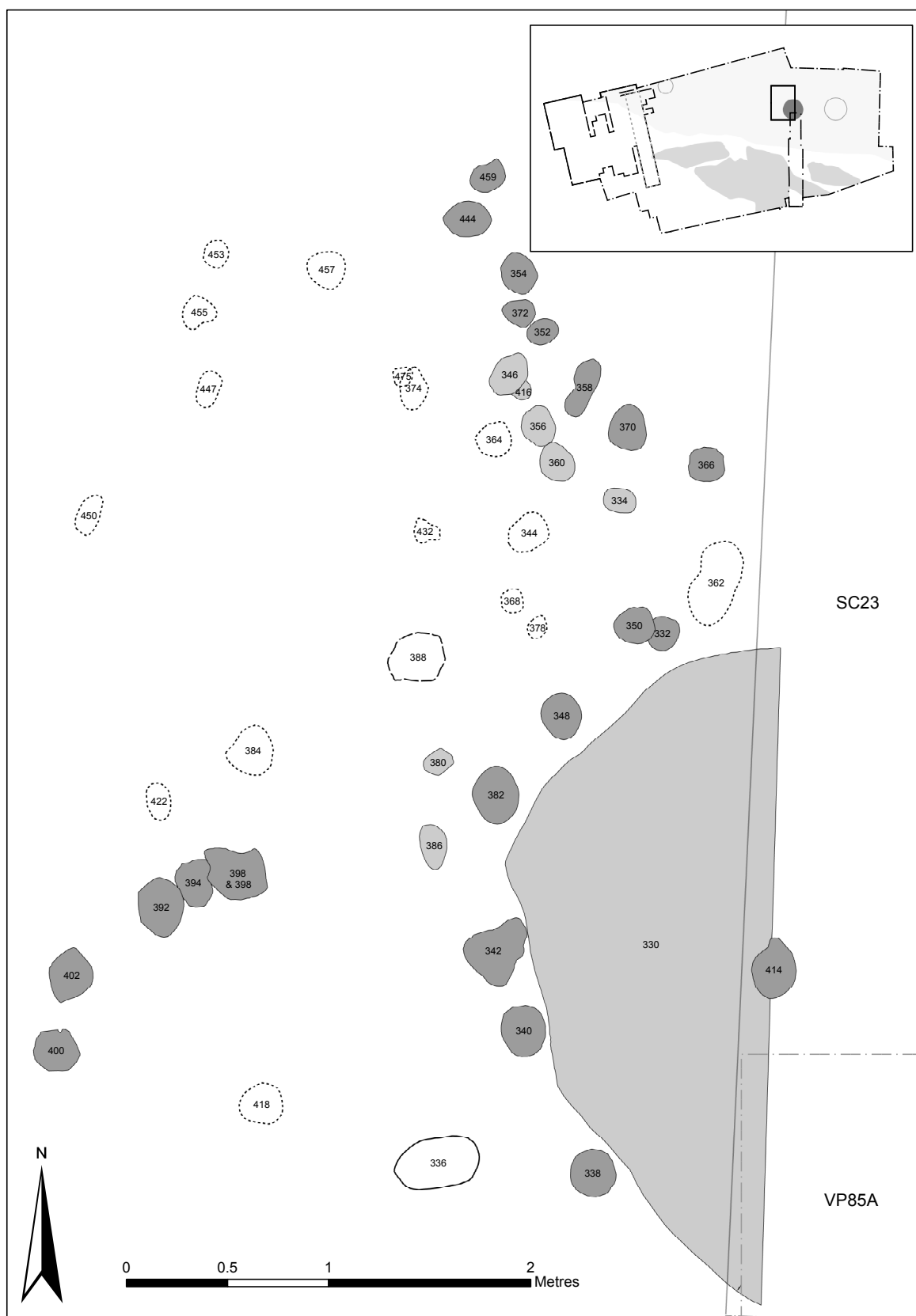


Figure 5.3: Plan of the central structure and postholes around it (Copyright Star Carr Project, CC BY-NC 4.0).

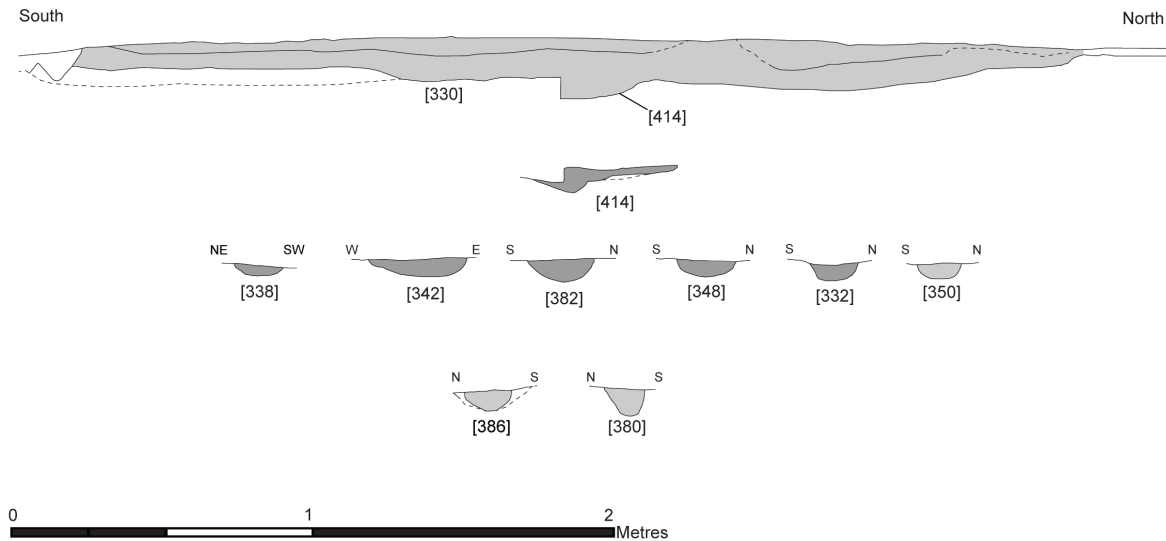


Figure 5.4: Profiles of the features comprising the central structure (Copyright Star Carr Project, CC BY-NC 4.0).

shown the area delimited by the hollow and the surrounding features is very different to the area outside of these features, which may suggest the presence of a wall or other barrier (Chapter 21). In addition, the very different geochemical signature recorded immediately to the south-west could indicate the presence of an entrance or exit to the structure at this location (Chapter 21 and see below). If the hollow and the surrounding postholes formed a regular shape, the structure probably formed an oval, orientated north-west/south-east, with an overall footprint of c. 4 m by c. 3 m. This would have been slightly larger if the outer pair of possible postholes formed part of the same structure. With the exception of feature [380] (which is likely to have held an upright post), there is no indication of whether the posts (and therefore the walls) were vertical or at an angle. It is possible that feature [414] may have held a central support or other internal feature, though this may have been unnecessary depending on the character of the structure. In contrast to the western and eastern structures there is very little lithic material associated with this structure, and most of the material recovered probably post-dates its use (Chapter 8).

The northern structure

A possible further structure (the northern structure) can be suggested to the north of the central dryland structure. This structure consists of an arc of eight features ([366], [370], [358], [352], [372], [354], [444], [459]) that runs for just over 2 m, with a second, shorter arc made up of five features ([334], [360], [356], [416], [346]) along its western side (Figures 5.3 and 5.5).

The features of the inner arc are all round or subround (feature [358] appears oval in plan but is actually made up of two smaller, rounded features). Features [352], [372], [444] and [459] have angled sides that slope down to a small curved base and could be stake or postholes (probably holding vertical stakes or posts). The remaining features have flatter bases with straight or sloping sides and cannot be assigned to a particular function on the basis of their form. The features forming the outer arc are sub-rounded/oval in shape. Of these, the profiles of features [360] and [346] could suggest that they were the remains of postholes, whilst the others are more ambiguous.

The northern structure is made up of at least one arc of features. Of the inner arc, four features can be interpreted as postholes on the basis of their morphology, and the remainder have been interpreted as the potential remains of postholes on the basis of their spatial relationship. It is possible that this arc of features was part of one side of a larger, circular or oval structure that extended to the north and east into trench SC23 but that the remaining postholes were either missed during the earlier excavations or had left no visible trace. If this is the case then the footprint of the structure was approximately 3.2 m by 2.8 m. Alternatively the structure may only have consisted of an arc of postholes, possibly supporting a wall or other structural feature. None of the features were deep enough to support a free-standing post of any significant height, suggesting that either the

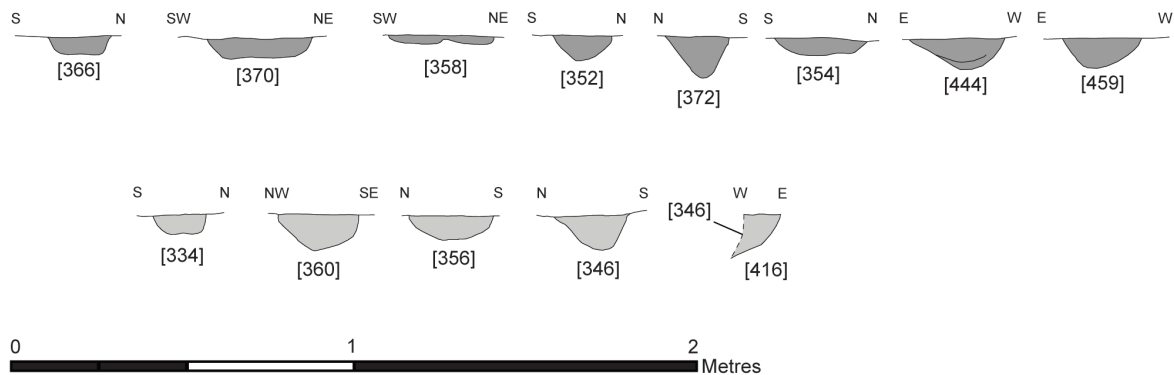


Figure 5.5: Profiles of the features comprising the northern structure (see Figure 5.3) (Copyright Star Carr Project, CC BY-NC 4.0).

posts were short, or that the purpose of the features was to hold posts in position rather than provide structural support in their own right. The outer arc is more tenuous than the inner one, though at least two of these features are potential postholes, probably holding vertical posts. This may represent part of the same structure or a separate arrangement of postholes.

Other potential structural features and pits in the central area

In addition to those features described above there were a scattering of features to the west and north of the central structure. Amongst these is an arc of six features ([400], [402], [392], [394], [398] and [396]), which lies to the west of the central structure (Figure 5.3 and 5.6). The features are all broadly sub-rounded (though the actual shape in plan of features [396] and [398] is difficult to discern), with sloping sides and a rounded base, though they vary in size and depth. There are at least two phases to this arrangement. Feature [394] is later, and cuts feature [398]. Features [398] and [396] also inter-cut, though the relationship between the two could not be established.

Most of the remaining features were classed as either potential postholes or as potential posthole/pits on the basis of their shape. None form a clear arrangement that could be interpreted as a building in the same way as the eastern, central or western structures, though they may have formed parts of smaller structural features. One feature [336] was identified as a pit on the basis of its fills. This was a small, oval feature 420 × 240 mm, with a bowl-shaped profile, that lay just outside the central structure (Figures 5.3 and 5.6). The fill (337) of the pit contained a very tight concentration of 25 pieces of worked flint and 24 fragments of animal bone. Most of the flint and all but one piece of animal bone have been heat affected, though there was no indication of in situ burning, suggesting the material had been collected together and then deposited into the feature. A second feature [388] has been interpreted (albeit tentatively) as a possible pit on the basis of its shape and size.

Finally, a single feature [451] lay approximately 7 m to the south-west of the central structure and the main concentration of pits and postholes (see Chapter 20, Figure 20.4). The feature was oval in plan, with a diameter approaching that of the larger pits and postholes, but was deeper (c. 30 mm deep) than other features at the site. From its profile, it could have supported a relatively wide and tall post, though given the lack of any associated features (and the absence of finds from its fill) it is difficult to infer a possible function.

Geochemistry in the central area

The results of the geochemical analysis provide some further information on the character of the structures in this part of the site and their relationship to the surrounding area (see Chapter 21 for a full discussion).

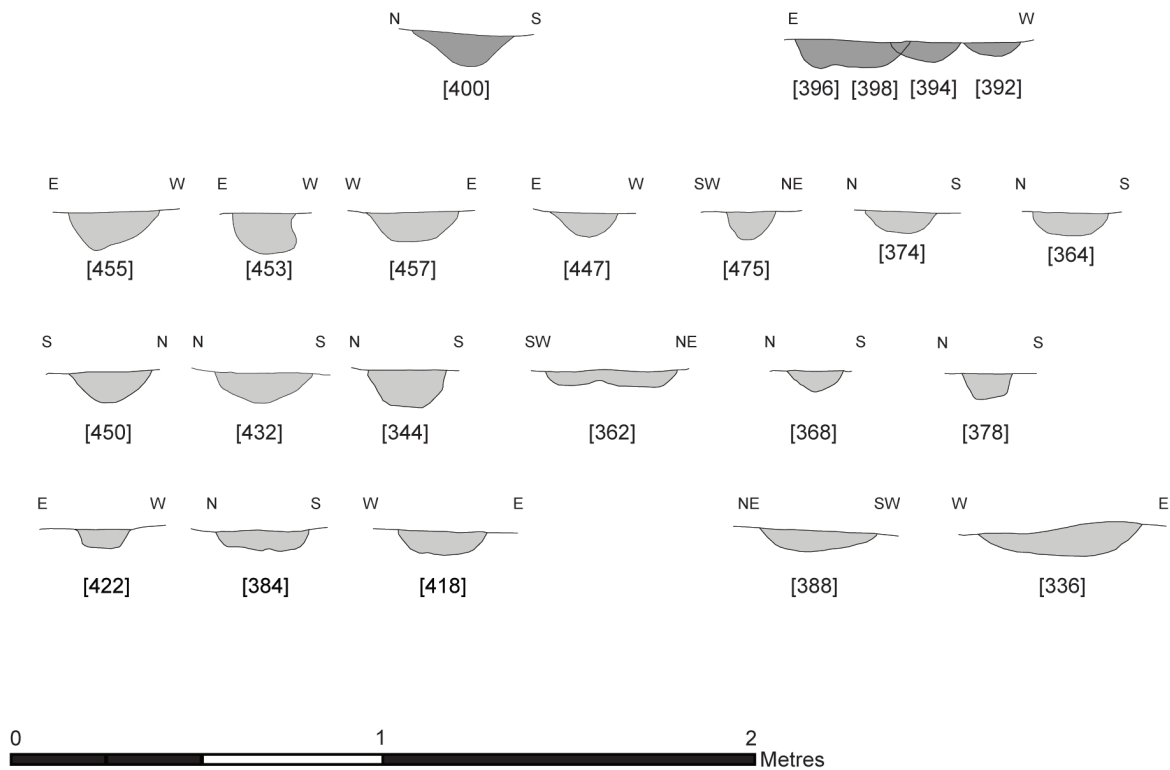


Figure 5.6: Profiles of other potential features in the central area (Copyright Star Carr Project, CC BY-NC 4.0).

The analysis has shown the samples taken from the area delimited by the postholes of the central structure are depleted in elements when compared with samples from outside the structure. This implies that activities within the structure were physically bounded, presumably by a wall or other barrier. It would also suggest that either the nature of activity within the structure was notably different to that taking place outside or that the interior of the structure was kept clean and that material was being removed and deposited elsewhere.

Samples taken just to the south-west of the structure have very high levels of phosphorus/phosphate which may be the result of more intensive deposition of organic material. This could be the result of waste material (potentially human waste) being deposited here from within the structure, implying the presence of an entrance. Alternatively it could relate to the use of pit [336], the fill of which contained a high proportion of burnt animal bone and flint.

The eastern structure

The eastern structure consisted of a shallow, irregularly shaped hollow, surrounded by an arrangement of 18 possible postholes (Figures 5.7 and 5.8). The central hollow was c. 200 mm deep with a maximum diameter of just over 2.8 m and had two distinct fills; an upper fill, which contained large concentrations of flint, and a lower fill, from which a much smaller assemblage of lithic material was recovered. Micromorphological analysis of these deposits showed that the lower fill had a very high organic content, probably resulting from the presence of a basal layer of plant material (such as reeds or bark) within the hollow, which had become oxidised, humified and bioturbated (French 2008). Although macroscopically visible charcoal was not noted within this feature during excavation (Conneller et al. 2012), more recent flotation of samples from the hollow have recovered small quantities of charcoal (deriving from birch and willow/poplar) whilst micro-charcoal was recovered from throughout the deposits (see Chapter 32).



Figure 5.7: The eastern dryland structure looking east, with the hollow and postholes around it which have been half sectioned (Copyright Star Carr Project, CC BY-NC 4.0).

The posthole features range in size and vary in their shape and profile (Figures 5.8 and 5.9). Feature [199] is clearly a posthole that held an upright post, as it contained a post-pipe with vertical sides and a rounded base. In addition, the profiles of features [177], [179], [181], [193] and potentially [171] and [201], which all have straight, near vertical sides and rounded bases, are also suggestive of postholes. Of these, the profile of feature [177] suggests that it could only have held a vertical post. The profile of feature [181] also suggests that it held an upright post, as the side closest to the hollow is vertical (if it held a post at an angle the profile would be more likely to slope towards the hollow) and the same is likely to be true of feature [201]. Of the remaining features, several could potentially be small pits, particularly features [169], [191] and [207], which have more regular bowl-like forms.

These features around the hollow comprise four spatial groups. The first two groups consist of arcs of possible features on the eastern side of the hollow; an inner arc of five features ([158], [156], [191], [207] and [193]), that lies up to 0.2 m from the edge of the hollow, and an outer arc of four features ([162], [160], [199] and [181]) that lies between 0.8 and 1.35 m from the hollow's edge. The other two groups are made up of separate clusters of features on the western side of the hollow; a southern group (features [169], [171], [173], [201] and [209]) and a northern group (features [167], [175], [177] and [179]).

The analysis of the lithic assemblages from this part of the site has shown that much of the refitting material respects the footprint formed by the outermost features surrounding the hollow (see Chapter 8, Figure 8.15). This would strongly suggest that at least some of the outer features supported a wall, which presumably formed the outer extent of the structure, whilst the remaining features were either internal supports or were part of other internal structures. Assuming that postholes were originally present along the entire length of each wall, then the structure would have been roughly trapezoidal in shape, with a curving wall at its south-east end, and would have been just over 4.1 m long and at least c. 3.6 m wide. However, it is possible that some features were missed during the excavation, or that the postholes were too slight to leave any trace, in which case the structure may have been circular or oval.

It is unlikely that the outermost postholes held large, substantial timbers. Of those features with regular, straight sides, none have a diameter greater than 190 mm, whilst the post-pipe in feature [199] has a diameter

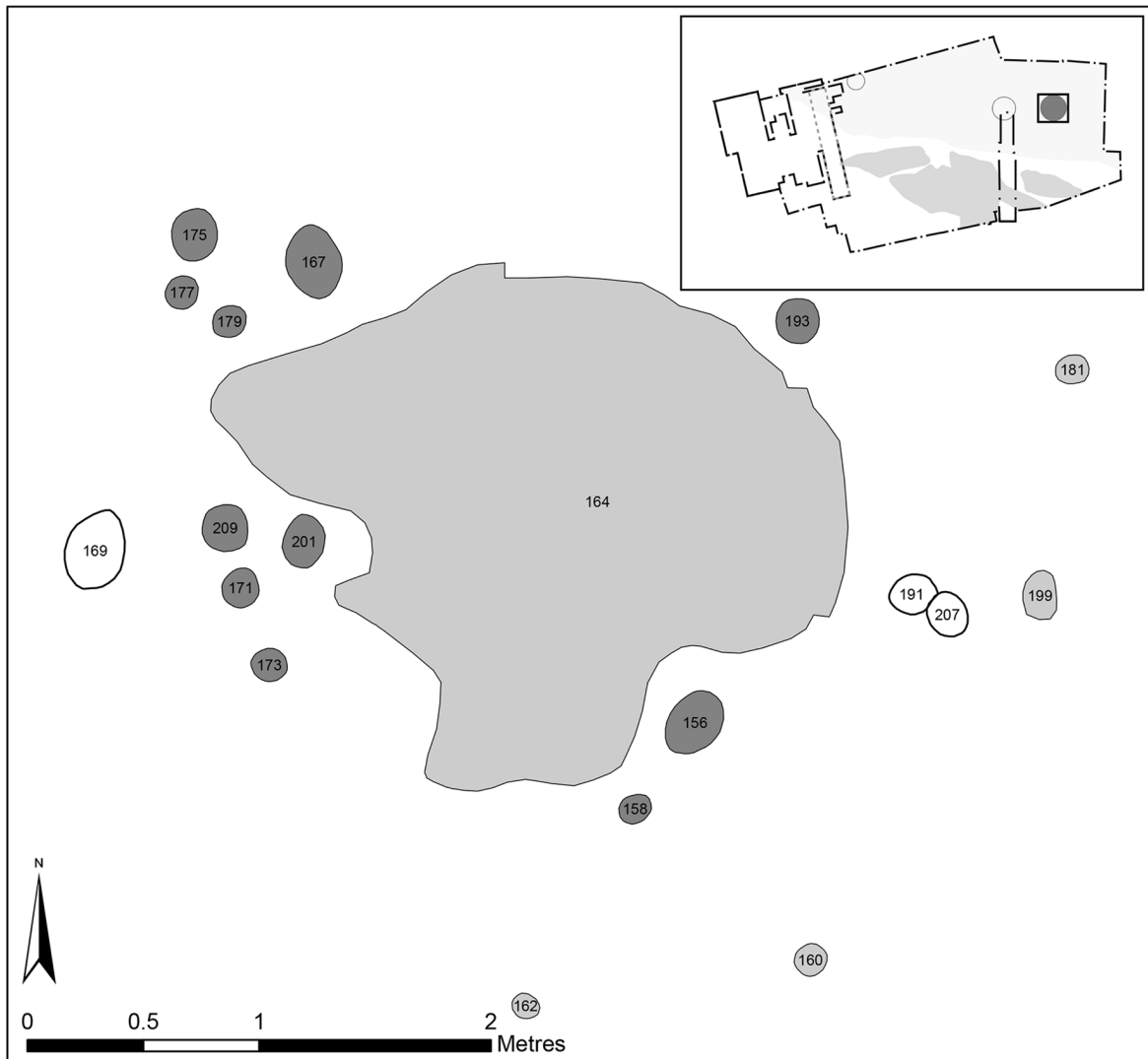


Figure 5.8: Plan of the features comprising the eastern dryland structure (Copyright Star Carr Project, CC BY-NC 4.0).

of only 60 mm. If the post-pipe is indicative of the structure as a whole then it was probably constructed from relatively thin posts or poles, though it is certainly possible that some of the features held thicker posts. From the orientation of the post-pipe in feature [199] and the profiles of the other postholes, these were probably held in an upright position. There is no clear evidence for an entrance, although both the north-east and south-west areas are free of posts and the lithic refitting suggests a possible entrance to the south-west (Chapter 8).

Conclusions

At least four structures can be identified from the arrangements of cut features and their relationship to the distribution of worked flint across the dryland parts of the site. Of these, both the eastern and central structures consisted of a hollow with postholes around it that probably held some form of wall (and potentially a roof). If the postholes of the northern structure originally formed a complete circuit then this may also have been a

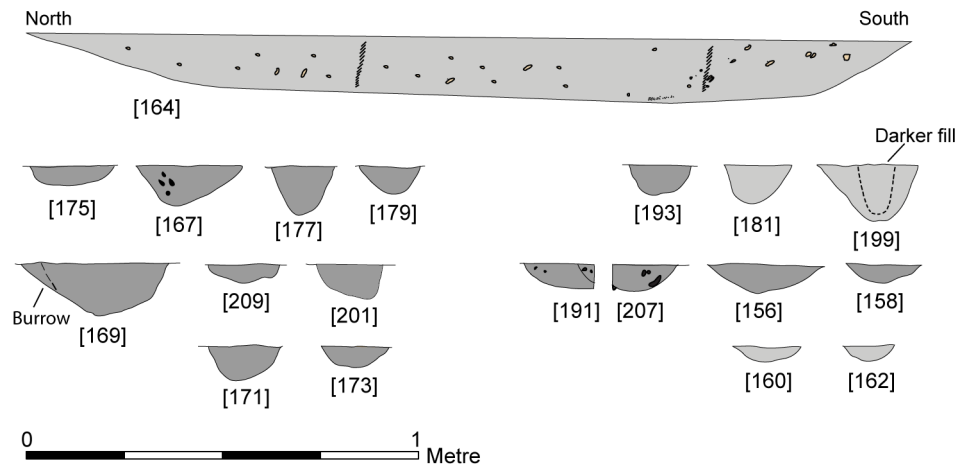


Figure 5.9: Profiles of the features comprising the eastern dryland structure (Copyright Star Carr Project, CC BY-NC 4.0).

walled, possibly roofed structure. Assuming this was the case, then all three are a similar oval shape and broadly comparable in size, ranging from 3.6–4.2 m long and 2.6–3.8 m wide. The character of the western structure appears to have been different and the excavated features may have held internal supports for a larger structure.

Both the eastern and possible northern structure appear to have been built with relatively thin upright posts or poles. The post-pipe in feature [199] has a diameter of only 60 mm, and if we take this as indicative of the size of post held by features of a similar size, then it most probably held thin posts or poles up to 100 mm thick. Posts at the smaller end of this range are unlikely to have borne the weight of a roof, and instead probably formed part of a frame or lattice made from relatively thin, flexible stems that was essentially self-supporting. In this case, the function of the postholes was probably to hold this frame in place and stop the building from moving. Though we lack the evidence from the central structure we could assume that it was built using similar methods.

Drawing on examples from the historical and ethnographic literature, there are several ways in which such a building could be constructed (Faegre 1979). One way is to set long poles (typically young saplings) into a circular or oval arrangement of postholes and then bend these over to create a dome or tunnel. Where the saplings meet in the middle of the dome, they are bound together using cord made from tree bast or other plant materials. Horizontal poles may be added, again lashed to the saplings using plant materials, to create a sturdier frame, which is then covered to create walls and a roof. These coverings are sometimes held in place by a second outer frame, or by angled poles.

Alternatively, if we assume that some of the posts were at the wider end of the range (perhaps 100 mm diameter or slightly more), then some of the inner postholes in the eastern structure might have performed a structural function, possibly supporting an internal set of more substantial upright posts that provided additional support for an external frame. In ethnographic examples these upright posts support a circular arrangement of horizontal beams, that in turn help to support an external conical frame constructed from poles or saplings set into an outer ring of postholes. Again, this outer frame is reinforced by the addition of horizontal poles, and the frame is then covered with other materials to create solid walls. In the case of the central structure, the single possible posthole from the centre of the hollow may have also acted to help support the external frame.

Whilst there is no archaeological evidence for the materials that were used to form the walls and roof, from the historical and ethnographic literature it is clear that there were a range of possible choices available to the inhabitants of Star Carr (Figure 5.10). This could include thatch (possibly of reeds), mats made from reed (stitched or woven together), birch bark or animal hides. Reed mats could also be attached to the inside of the frame, to help insulate the structure, or used as flooring. Given the amount of woodworking debris in the wetlands at Star Carr, it is also possible that thin, split timbers may have been used, either for the walls, roof or perhaps both.



Figure 5.10: Reconstruction of a Mesolithic-type house built at Archeon, an archaeological living museum in the Netherlands. This structure is larger than those found at Star Carr (7×5 m by 3.5 m high) (Copyright Leo Walterbeek, CC BY-NC 4.0).

The western structure is difficult to interpret as it lacks a relationship with a central hollow or a particularly coherent alignment and is not so clearly respected by the associated lithic scatter. This makes it harder to tell if the features represent single or multiple structures, or the function they may have performed in its construction. Assuming the features all held upright posts then they could feasibly have provided internal supports for a larger structure, the outer edge of which is reflected by the edge of the dense concentration of burnt flint. This may have been constructed in a similar way to the eastern structure, with an inner set of uprights, possibly supporting horizontal beams, and an outer frame of thinner saplings set into postholes that were not substantial enough to leave any trace. Alternatively, one or more of the postholes may have held a central upright post, which supported a covering of hides or similar material that was pegged into the ground on an arc defined by the extent of the lithic scatter, though such an interpretation is tentative.

However, the features need not have supported a roofed structure and their location may suggest that they performed other functions. This could include racks made from a framework of upright and possibly angled, posts or poles that could be used for drying or smoking fish, or plant materials, or for processing hides. This would certainly fit with the more rectilinear arrangement of the possible postholes and potentially the evidence for burning and craft activities represented in the flint assemblage (see Chapter 8). Similar features may also have resulted in the scatter of possible postholes in the area around the central structure. Though few of these form a coherent pattern, at least some may be the remains of storage structures, either built on the ground or raised on timber frames with floors made from split timbers or bark mats and used to store foods, materials, or items of equipment. Similarly, they could have been drying racks. Given the evidence for fish processing, plant processing and hide working on the site (Chapter 8), frames for such activities are certainly a possibility.

Overall, it is important to note that the structures that have been identified probably represent a fraction of the built structures on the site. For example, settlements of the Khanty, in Western Siberia, can include storage sheds, wood piles, ovens, raised caches, shelters for dogs, fenced smudge hearths (to repel mosquitoes) and stakes for hanging boots to dry, as well as dwelling structures (Glavatskaya 2006). Not only would many of these be hard to identify from arrangements of postholes, even with associated material culture, but some would leave little or no archaeological trace. Temporary lean-to shelters made from arrangements of wooden poles would not require postholes and neither would frames used for cooking food over fires, or drying meat or fish, whilst some more substantial buildings such as timber-built storage sheds or smokehouses can be free-standing. What is more, people at Star Carr may have used living trees as part of the structure of some buildings. The Orochen Evenki of southern Siberia construct storage structures (*guula*) on wooden platforms built on the trunks of living trees (Anderson 2006, 18), whilst some temporary structures and tents also make use of trees. Again, such structures would leave no archaeological trace but may well have formed part of the architecture of sites such as Star Carr.

The Star Carr structures are the earliest known examples of Mesolithic buildings in Britain and Ireland and contribute to the growing body of evidence that we have for architecture in this period. The only other structure that may be close in date to those at Star Carr was recorded at Deepcar, South Yorkshire (Radley and Mellars 1964). Though this was similar in size to those found at Star Carr, c. 3.4×2.1 m and was focused on a central hollow, there were no postholes and instead the hollow was delimited by stones. Another potentially early structure may be present at Three Ways Wharf (Lewis and Rackham 2011), where the distribution of worked flint making up one of the scatters may reflect the presence of a tent or building.

The evidence becomes more extensive as we move into the centuries around 8000 cal BC, when we see the appearance of larger, circular structures such as those excavated at Mount Sandel, Ireland (Woodman 1987; Bayliss and Woodman 2009), Howick, England (Waddington 2007), East Barns (Gooder 2007) and Echline, Scotland (Robertson et al. 2013) and Ronaldsway airport on the Isle of Man, excavated by Oxford Archaeology. In most cases these structures are focused around a deliberately constructed hollow with postholes running around the inside edge of the cut, some of which are angled inwards towards the centre of the feature. This would suggest a more conical structure than those at Star Carr.

Whilst it is tempting to see these later structures as representing the appearance of a new and distinct architectural tradition, there are distinct differences in the way they were built. In particular, Woodman has argued that whilst a deep, central hollow was certainly an aspect of the construction of the Howick structure, the shallow sunken areas at East Barns and Mount Sandel may simply have been the result of levelling the area ahead of the building of these structures (Woodman 2015, 309). As other researchers have noted, there are also a range of other structural forms during this, and later stages of the Mesolithic (e.g. Wickham-Jones 2004). Indeed, if the existing evidence for Mesolithic architecture is characterised by anything, it is diversity rather than similarity and until we find more Early Mesolithic sites with structures and generate a larger dataset we cannot be sure of any apparent patterning. Nevertheless, the data from Star Carr adds to the repertoire and range (both chronological and geographical) of Mesolithic architecture, and provides important new information on the way such structures were used.