# PART 12
# Mineral

*'The flint, on the working of which the whole technology of the Star Carr people depended, was mainly derived from the local drift, which could also have produced chert, stone pebbles of various kinds and iron pyrites—the latter doubtless used in conjunction with flint and tinder for producing fire.'*

(Clark 1954, 20)

CHAPTER 33

# Beads and Pendant

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## Introduction

During Clark's excavations a number of shale beads were found along with three fragments of amber, one of which appeared to have been perforated. In 2015 three beads (two in situ and one in Clark's backfill) and an engraved pendant were found at the site. The two in situ shale beads were discovered close to those plotted by Clark, in wood peat, and the pendant to the south of Clark's excavations in reed peat (Figure 33.1). Not surprisingly, the three shale beads are similar to those found by Clark, though the pendant is unique.

In addition, mèche de foret were also identified in spatial association with the shale beads. Mèche de foret are a specialised form of awl (Chapter 35), with extensive retouch to both long edges of a small blade, creating a pointed tool with irregular long edges, typically used for boring and piercing and well suited to making beads (Jacobi 1976). Clark (1954, 96, 106) reported the discovery of 114 awls of various types at Star Carr, noting that the tip had been worn smooth in some examples and entirely removed in 14 cases, a pattern that would be consistent with a highly abrasive task such as perforating stone. Clark (1954, 166) suggested that the beads found at Star Carr had probably been perforated with a hafted mèche de foret using a bow, which would have meant the tool could have been rotated at speed. More recently, experimental replication suggested that this is the most efficient method of production, while working freehand was reported as cumbersome and time-consuming (David 2007, 105).

This chapter considers the beads recovered from Star Carr, both from the excavations by Clark and those recovered during the most recent phase of excavation. In this study the three beads and the pendant have been examined using microwear analysis and residue analysis to test whether any engraved lines could be located, if any pigment residues were present, and in order to identify any traces relating to their suspension and wear. Actualistic experiments were conducted in order to reconstruct how the pendant, shale beads and amber pendants might have been made and to test the hypothesis concerning the use of a bow versus hand drilling.

**Figure 33 (page 461):** Making a replica pendant (Copyright Aimée Little, CC BY-NC 4.0).

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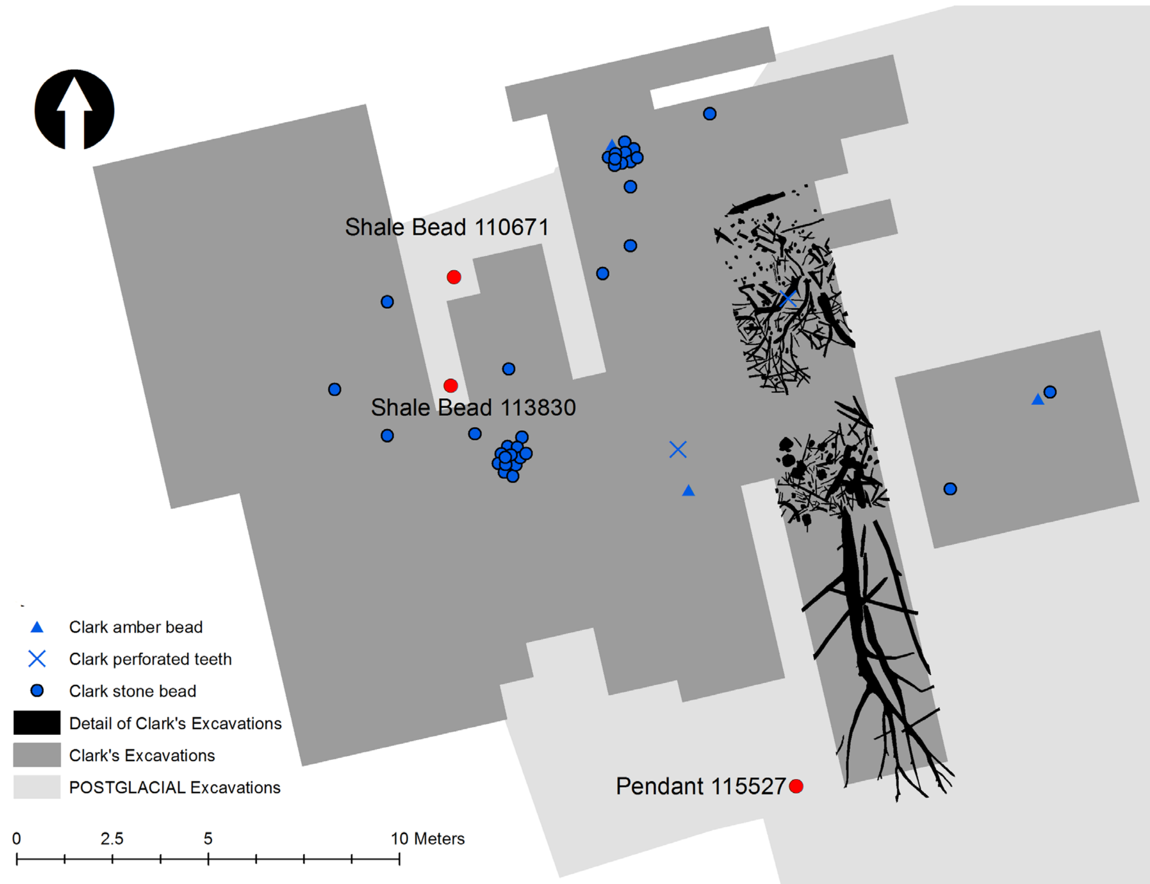


**Figure 33.1:** Figure to show locations of the beads found by Clark (in blue), and the two beads and a pendant found in our recent excavations (in red) (Sourced from Milner et al. 2016, *Internet Archaeology* licenced under CC-BY 2.0).

## Previous analysis

During Clark's excavations, a variety of beads were recovered, made with a range of materials including: three pieces of amber, two of which were broken and another with two perforations at one end; 33 shale beads; two red deer teeth (an incisor and a vestigial canine which had been perforated) and a possible bird bone bead (Clark 1954, 164–166). The collection is now split and resides in numerous museums, though not all examples have been relocated. Only two of the pieces of Star Carr amber have been located in museums (Milner et al. 2013b): the whereabouts of amber 1 is unknown, amber 2 is curated in the Natural History Museum (NHM), while the perforated piece (amber 3) is curated in the Museum of Archaeology and Anthropology (MAA). One of the Star Carr perforated animal teeth is in the NHM, the other has not been located and the possible bird bone bead is located in the MAA.

All of the shale beads were made from thin disc-like pebbles of Lias shale which can be found locally both in the upcast from cleaning the drains around the site, as well as at the coast around Robin Hood's Bay. Most beads conform to an irregularly circular to oval shape, ranging in size from 7.5 × 9 to 12 × 20 mm, and averaging 1.3–2.0 mm in thickness. One bead stands out as being different in that it is a 'celtiform shape', perforated at one end. The stone beads were found in clusters, as though marking places where breaks had occurred in necklaces, with 12 being found in IJ 23–24 and eight from AB18–19 (Figure 33.2). Clark (1954, 166) noted that because the beads were so thin, they had been perforated from one face only, and suggested that these may have been made rapidly using a drill which could have been rotated at speed by means of a bow, noting that


**Figure 33.2:** Example shale beads and 'celtiform bead' found by Clark at Star Carr. These examples are curated at the MAA (Photograph taken by Nicky Milner. Sourced from Milner et al. 2016, *Internet Archaeology,* licenced under CC-BY 2.0).

the precision of the perforation was unlikely to be produced working freehand. Not all of the shale beads have been located in museums: 23 are curated in the MAA including the celtiform (Figure 33.2), and there is one in the British Museum.

Pieces of amber can be found washed up on the east coast of Britain, the probable source of the amber used at Star Carr, though they would be a rarity, having been transported and secondarily deposited. As Doggerland was not drowned at this time (Bicket and Tizzard 2015), this may also have been a possible source for amber. The pieces of amber, otherwise a rarity in the British Mesolithic, hint at a connection with Southern Scandinavia where the use of amber to make pendants and carved animals was common. The spatial association of a cluster of shale beads alongside amber led Clark (1954, 165) to suggest that these different distinct bead and pendant forms may have been strung together on the same string of beads (Figure 33.1).

## Methods

A suite of digital imaging techniques were applied to the pendant: scanning electron microscopy (SEM), reflectance transformation imaging (RTI) and structured light scanning. In addition, the pendant was examined for residues using visible light microscopy (VLM), variable pressure scanning electron microscopy (VP-SEM), and confocal Micro-Raman. The results are summarised here, but a more extensive report and access to the RTI (which can be manipulated online) is available in Milner et al. (2016).

The shale beads were washed, handled and analysed in the same fashion as lithics for residue analysis, involving a rinse with a fine stream of ultrapure water, and handling with non-powder nitrile gloves. The beads were air dried on cling film–lined trays and examined microscopically with a stereoscope (GX Microscopes XTL3T101) (×.7-4.5, eyepiece magnification ×10). The stage of the metallographic reflected VLM (Leica DM1750 M) was lined with a new sheet of wax parafilm between sample viewing to prevent cross contamination. The beads were examined using objectives ranging from ×5 to ×100, and with an eyepiece magnification of ×16. Composite z-stacked microscopic images were captured and stitched together using LAS Montage software. Description of residues and their locations were documented. A VP-SEM (Hitachi TM3030Plus) was chosen for analysis of residues and engraved lines because it is capable of imaging objects non-destructively without any coatings that are used in traditional high vacuum SEM. Confocal Micro-Raman (HORIBA Jobin Yvon Xplora) was carried out on in situ residues of interest, allowing chemical characterisation, and LabSpec 6 and IGOR Pro software used to collect and evaluate spectra.

Microwear analysis was undertaken as set out in Chapter 15. In addition, to further enhance understanding of the beads and pendants, actualistic experiments were performed to replicate them.

## Description of the beads and pendant

The pendant was found within detrital mud (317) and is likely to be contemporary with Clark's area (Chapter 3, Figure 17.15). The two in situ beads were found in wood peat (310), higher up slope, north of Clark's cutting III dated to c. 88th century cal BC (Chapter 3 and Figure 17.20). Although the deposition activities in Clark's area are likely to be very short lived, the probability distributions for each area overlap, meaning it is not clear whether the pendant is older, younger or contemporary with the beads.

The pendant and beads were made of shale, which as described above can be locally obtained. Dimensions for the beads are: backfill bead, 34 mm × 20 mm; in situ beads <113830>, 14 mm × 11 mm; <110671>, 18 mm × 11 mm (Figure 33.3). A strong question mark must be raised against the bead from the backfill, as it differs both in size and morphology both from those recovered by Clark and during the current excavation, being large, and much less waterworn or polished than the others. Given fakes are known from Clark's backfill (a piece of 'Mesolithic' pottery recovered in 2007, but previously known from oral histories of the site (Milner et al. 2013c)), this piece needs to be treated with caution.

The engraved pendant (Figure 33.4) is weathered, and the engravings are subtle and difficult to see with the naked eye, only visible by angling the pendant obliquely in the light. Analysis revealed that the engravings


**Figure 33.3:** (left) bead <113830>; (middle) backfill bead; (right) bead <110671> side 1 and 2. Note the abraded surface and damage on side 2 (Photograph taken by Paul Shields. Copyright University of York, CC BY-NC 4.0).


**Figure 33.4:** Photograph of the pendant from both sides (Photograph taken by Michael Bamforth. Sourced from Milner et al. 2016, *Internet Archaeology* licenced under CC-BY 2.0).

consisted of a series of parallel lines with a number of very small lines drawn at right angles from them, creating a 'barbed line' motif. This is comparable to styles known from the continent, most closely matching examples found in Southern Scandinavia (Milner et al. 2016). The digital techniques used facilitated the sequencing of the engraved lines (Figure 33.5). This analysis revealed a repeating pattern of barbed lines flanking parallel lines: group 2, 2a, 2b, and group 3b, 3b1 and 3b2, which both have three parallel lines between them, and group 4c, 4c1 and 4c2 with one line in the middle. There is some patterning to these barbed lines, but this is not consistent from one set to another. Lines in the 2a group are patterned as 5, 4, 3, 2 (from top to bottom). However, the corresponding 2b appear to group as 2 (though the first line crosses beyond the line and is not a true barb in that sense), 6 (though another line crosses), 5 and 5. In the 3b grouping, lines 3b1 follow the sequence (from left to right) 4, 4, 3 (though on the latter there is a very small mark, seen viewed under RTI (see Milner et al. 2016), which could be another line, taking this to 4). The group 3b2 are very hard to read, partly because they are obscured by lines 5; however, they too look to be groupings of 4. The group 4c with barbs 4c1 and 4c2 are very different: 4c1 has a grouping of 3 and 2, and 4c2, groupings of 3 and 7.

Given the patterning in some of these groups of lines, it is interesting to consider whether this was intentional and what it might represent. Barbed points are also known to incorporate groupings of lines at Star Carr (Chapter 25), as well as two elk bodkins (EB1 and EB7) found by Clark (1954, 160).

Complex pieces of mobile art such as the pendant will always be difficult to interpret. The pendant has proved evocative for both the team and the public, with many interpretations raised. A popular theme is that the pendant was a shamanic amulet, an idea that finds support in the ethnographic record (e.g. Hill 2011). Another recurring observation was that the barbed point motif was very similar to Ogham script, an early Medieval Irish form of writing used in the 1st–9th centuries AD, about 9000 years later than the pendant. Although this makes it highly unlikely to be a precursor to Ogham, using groupings of marks can clearly be used for communication and as symbols. If this was the case, the engravings are so faint it is hard to see how this might be used to communicate between different people, but the possibility should not be discounted. Other ideas that have been put forward include it representing a link to the stars, a map, a bird, the lines on the palm of a hand, a river and channels diverting water, a (burning) tree, a leaf or the wooden platforms found on the site. Many

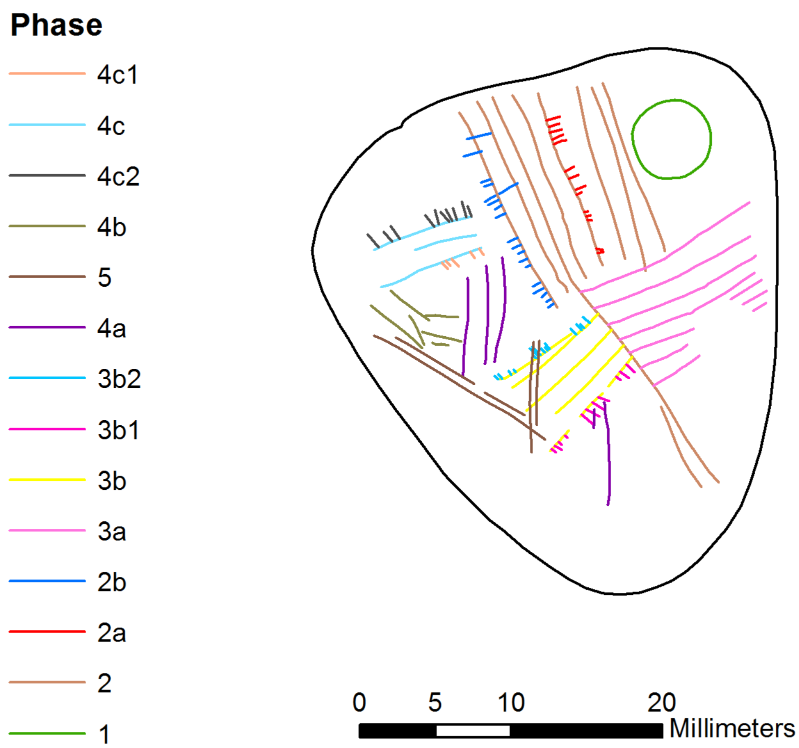


**Figure 33.5:** The phasing of the lines (see also Milner et al. 2016) (Sourced from Milner et al. 2016, *Internet Archaeology* licenced under CC-BY 2.0).

of these theories share a sense that the engraving contains symbolic content, whether as a numerical or communicative system, or in the depiction of a particular aspect of the Mesolithic world.

## Microscopic approaches to identifying residue and wear traces

### *Pendant*

Residue analysis was conducted on the lines of the pendant but showed no evidence that pigments had been used in highlighting the lines, unlike some examples in Denmark where pitch has apparently been used (Milner et al. 2016). The residue analysis used VLM, VP-SEM and confocal Micro-Raman to confirm the presence of framboidal and triangular pyrite on the pendant and also showed lacustrine microfauna were present within the engraved lines. Microwear analysis was undertaken in order to determine whether the pendant had been strung but the results were inconclusive.

### *Beads*

No residues of archaeological significance were identified on the shale beads. However, the soil residues present on the beads shed light on the chemical and biological circumstances of the surrounding soil and

**Figure 33.6 (page 469):** Possible crosshatch engraving on side 2 of the backfill bead (Copyright Matthew Von Tersch, CC BY-NC 4.0).

deposition (Croft 2017). Crystals suspected to be gypsum were visible macroscopically. During microscopic analysis, these crystals were clear and present in rosette shapes, a crystal habit expected of gypsum. Iron oxide deposits were encountered in association with elongate plant cell walls, possibly the remains of the epidermal tissue of reeds. These traces are all reflective of the burial environment at the site, which is rapidly degrading (Chapter 22).

A general issue encountered during microwear analysis of the beads was the difficulty in identifying clear evidence of wear traces. This is likely due to a number of factors: a) the shale is relatively soft, and when combined with the acidic burial environment, it is possible that wear traces have been affected due to geochemical alteration of the surface, especially if the wear traces were lightly developed in the first place; b) despite having a matt appearance to the naked eye, at a microscopic level the shale is surprisingly reflective, probably as a result of the pyrite microcrystals from the burial environment; this could be obscuring lightly developed polish if present; c) that they were worn for such a short duration of time that no wear traces have developed, an argument previously proposed for the pendant (Milner et al. 2016); and d) considering their association with mèche de foret and the probability that bead production was taking place at Star Carr, it is not inconceivable that the beads were not worn at all, but rather intended for circulation elsewhere in the landscape. Nonetheless, macro and microscopic analysis was able to reveal some interesting information regarding their materiality and possibly even their use.

For the three shale beads examined here, the side which exhibits the wider opening of the perforation (the side from which the perforation was initiated) is referred to as 'side 1', with the opposing side designated 'side 2'.

1) Backfill bead: under certain light, and under closer inspection with a stereoscope, this bead has a series of crosshatch lines, quite regular, and limited to one half of the surface of side 2 (Figure 33.6). However, on side 1, there are clear signs of post-depositional surface modification (PDSM) in the form of trowel marks,

making it difficult to say emphatically that side 2 is engraved. Mindful of the fact it was recovered from backfill and therefore could have received prior damage during excavation, there are a couple of key differences between sides 1 and 2 which deserve note. The trowel damage on side 1 is fresh in appearance and unidirectional, whereas the crosshatch marks on side 2 are, as the term suggests, overlapping and geometric. They are not fresh, but worn, suggesting they were made in antiquity. Furthermore, the geometric design is not unlike that identified on a number of barbed points (Chapter 25). However, we cannot be certain when in antiquity these marks were made. We present the possibility that this is an authentic engraved bead with a strong caveat.

Use-related traces were examined using a high power microscope. Striations were observed radiating out of the perforation and at first it was thought these might have resulted from suspension wear. However, when a greater area of the surface was analysed, comparable striations were also observed, running in multiple directions making it difficult to ascertain what striations are use-related from those caused by PDSM. Given its post-depositional history, we are hesitant to interpret these traces as use-related.

2) <110671>*:* Immediately visually apparent is the contrast between side 1 and side 2, with the latter displaying an abraded surface, with nearly all the surface area affected. Under low-power magnification this abrasion appears to be the result of the removal of the outer surface: whether that is from taphonomic processes caused by the burial environment or from wear caused by sustained contact with another material, is not certain. However, at each terminus of the long axis of the bead there is damage in the form of micro-crushing and flaking. It is tempting to see this damage as relating to wear: the location of the damage is compatible with where suspension traces might exist if it were to be strung along the long axis of the bead; however, no associated micropolish was identified. In contrast, side 1 shows no surface abrasion, having the same macroscopically good-quality surface condition as bead <113830>. If the abrasion and damage to the terminus of the bead is due to use, its distribution suggests that side 1 was facing outwards and side 2 was attached to another material, perhaps clothing, in which case this bead may have been used/worn as an appliqué.

3) <113830>: Macroscopically a thin line is visible running across the long axis. It can be seen on both sides and is just off centre from the line of the perforation, making it unlikely that this is wear related to suspension. It is probable that this is a natural fault in the geology. Unlike the other beads analysed under high-power magnification, this bead was less reflective, making it easier to distinguish polish when present. Both sides displayed polish, which appeared randomly distributed and was limited to the upper topography of the surface. At times this was well developed. Neither side exhibited more than the other, although within the outer edge of the perforation on side 1, the polish was notably more developed. What contact material and action caused the polish is unclear. In some places it has a mineral-like appearance with numerous microstriae (perhaps the result of contact with other shale beads); other spots of polish are brighter/smoother and could be described as more plant-like. Again, it is tempting to suggest that these traces may be from wear (especially given the developed polish on the rim of the perforation); however, because of their random distribution and given the softness of the shale, we cannot be certain that this is not PDSM, resulting from thousands of years of gentle abrasion from sitting in wood peat.

## Actualistic experiments

### *The pendant*

To further enhance understanding of the pendant, an actualistic experiment was performed to replicate it (Figure 33.7). The creation of the perforation and engraving of lines was rapid in both cases, taking only a few minutes to complete. A small blade was used to create the engravings. Each line was produced by a single stroke of the blade. Long lines were engraved first, followed by small barbed lines. Perhaps the clearest point of contrast between the replica and the pendant is the nature of the engraved lines when fresh. These stand out as a clear and vibrant white against the grey of the shale. Weathering has obscured the impact of this feature on the archaeological pendant. Further work is needed to test how resistant this marked contrast is through time and with use. As the white colouration is produced by the deposition of fine powder within the groove as a residue of the engraving process, it is probable that this white colouration was ephemeral, but could be readily refreshed with the re-engraving of the grooves, perhaps for special events.

**Figure 33.7:** Experimentally made replica engraved pendant (Copyright Aimée Little, CC BY-NC 4.0).

### *Bead manufacture*

Pieces of shale, both weathered rounded discs and larger amorphous shapes, were collected from Whitby and Robin Hood's Bay on the North Yorkshire coast. Baltic amber was used to replicate the amber bead. Bone and stone tool replicas were hafted to wooden shafts made from hazel, and willow bast fibres were used for binding.

Because of their naturally very smooth appearance, we hypothesised that naturally rounded pebbles of shale, weathered by water action, were used as natural bead blanks. The coastal shale required little modification: bead blanks were manufactured by grinding larger, amorphous pieces of shale against a fine sandstone until it was shaped into a thin disc. For pieces of angular, non–water rolled shale, we used flint to scour the shale, before using a hammerstone to gently tap the unwanted shale away (Figure 33.8). This left us with a small blank which was then transformed into a circular shape by grinding, leaving obvious working traces. The archaeological specimens show little in the way of working to either face; however, by burnishing the surface of the ground experimental beads using different materials (including charcoal, raw and soft hide, and a variety of sandstone cobbles ranging in texture from coarse to fine), it was possible to virtually remove all traces of grinding.

The shale beads from Star Carr have characteristic grooves scoring the inside of a conical perforation, with working typically initiated from a single direction. Experimental shale beads were perforated using mèche de foret and using a bone point, cut to give a roughly square cross section.

Two experiments with mèche de foret were carried out: one was used in the hand (Figure 33.9), the other hafted to make a hand drill. It was found that working with an unhafted mèche de foret and applying light pressure rapidly produced a perforation that could then be widened with the retouched edges of the tool, leaving the characteristic grooves within the perforation. By contrast, the use of a haft did not allow the application

**Figure 33.8:** Creating a bead blank by gently tapping away unwanted shale with a hammerstone (Copyright Aimée Little, CC BY-NC 4.0).

of pressure, took far longer to make a perforation, resulted in higher rates of breakage, and produced grooves within the perforation that were much finer than those observed on the Star Carr beads.

Microwear analysis was carried out on several mèche de foret of different sizes (Chapter 35). Analysis showed that larger mèche de foret were more commonly used for drilling osseous materials, whilst the smaller varieties more frequently display a soft mineral polish. For the latter, the very tip of the tool is sometimes broken, in other instances, it is rounded. It is likely that these traces of damage and rounding probably derived from use. For tools with damage at the tip, traces of polish remain, typically just above the point of breakage which often takes the form of a flake removal. The polish is bright, metallic in appearance, restricted in distribution and transverse to the lateral edges, suggesting a rotating motion. From experimental replication, using mèche de foret to drill shale, it was possible to replicate the polish visible on the archaeological tools. From this research, we have inferred that some mèche de foret were probably used in shale bead production.

A hafted bone tool was used to compare effectiveness. This proved ineffective and barely left a trace on the shale blank. Instead, the shale eroded the tip of the bone tool, suggesting that bone tools would not have been used to make these perforations.

A number of other worked stone with points were also tested. These were largely effective at creating a perforation; however, they tended to lack the characteristic grooves within the perforation, reflective of a retouched

**Figure 33.9 (page 473):** perforating a shale disc with a flint mèche de foret (Copyright Aimée Little, CC BY-NC 4.0).

edge as found with a mèche de foret. The use of other pointed stone tools cannot be ruled out but taking together the spatial association of mèche de foret in the bead area north of Clark's cutting III (Chapter 8), the microwear evidence (Chapter 35) and the distinctive patterning of grooving seen when experimenting with a mèche de foret, it is highly likely that mèche de foret were used in perforating the shale beads at Star Carr. Therefore, our results differ somewhat from the hypothesis set out by Clark (1954, 166) and David (2007), in that working with an unhafted mèche de foret proved to be highly effective, where a bead could be made in less than a minute by hand, suggesting a haft and bow may be technically unnecessary.

Unlike the shale beads, the two perforated amber beads from Star Carr have small, hourglass-shaped perforations suggesting biconical working (Clark 1954, 165). A complementary set of experiments was conducted on amber to assess whether the same working strategy was in operation for both raw material types. The same range of experiments was conducted on amber as on shale, working with a mèche de foret and bone tool, working uniconically, biconically, with the tool hafted and unhafted. The use of a shaped piece of bone, cut to a square cross section with a sharpened point, hafted with lime bast and a hazel shaft, proved to be highly effective. This tool drilled through even thick pieces of amber with ease. However, the perforation produced does not match the perforation described by Clark, being highly regular and straight sided, and with no obvious grooves or tool marks within the groove. Attempts to perforate with the mèche de foret were successful, but not universally so (Figure 33.10). A successful perforation was more likely with a narrower mèche de foret, with a concomitant reduction in the risk of splitting and breaking the amber. Overall, both the bone and flint tools are viable, but the mèche de foret produced a perforation which more closely matched the hourglass-shaped profile described by Clark.

The beads from Star Carr were most likely intended to be strung, and there are a number of ways in which they might have been suspended; whether as appliqué attached to clothing (Cristiani et al. 2014), woven into hair, strung separately or brought together into strings of beads (Figure 33.11). Our limited current evidence suggests that the Star Carr beads may have been attached to clothing; this is certainly the most common way that beads seem to have been worn in early prehistory (Taborin 2004, White 1997). Future research aims to address this question by conducting more actualistic experiments testing different possibilities of suspension followed by microwear analysis of the resulting wear traces.

**Figure 33.11:** Experimental replication of different types of suspension that may have been used for the Star Carr shale beads: (left) strung together with plant fibres; (middle) strung separately with raw animal hide; (right) sewn onto soft hide (clothing?) as appliqué (Copyright Aimée Little, CC BY-NC 4.0).

## The British context

The shale beads from Star Carr are not unique in the British Mesolithic; stone beads have been found at a number of early Mesolithic sites across the country. However, they are most numerous at the site of the Nab Head I, Pembrokeshire, Wales, which appears to represent a major manufacturing centre. A total of 692 shale beads have been found and further examples are likely to have been lost to erosion and local collections (Gordon Williams 1924, Berridge 1994, 110; David and Walker 2004, 312; David 2007, 105; Nash 2012, 78). At Nab Head the shale used to make beads was collected from local beaches and carefully selected for its natural form, being consistently water worn, oval in shape and around 2–3 mm thick. In addition, the method of working them appears to have been uniconical.

At the Nab Head I site, 7% (44) of all tools are mèche de foret, compared to 8% from Clark's excavations and 6% from the current excavations. This highlights a trend, previously noted by Jacobi (1980) and David (2007), for high concentrations of mèche de foret to be found on bead bearing sites. The Nab Head I mèche de foret show signs of wear and breakage to the tip, as well as wear to the ventral surface, indicative of rotational action, likely reflecting their use as drill bits (David 2007, 101). Although it is tempting to think that these two sites may have been somehow related, on the basis of the two radiocarbon dates currently available from Nab Head I (9210±80 BP, OxA-1495 and 9110±80 BP, OxA-1496), it is *100% probable* that the bead working there post-dates the bead working at Star Carr (*SUERC-66043*; Figure 17.16).

Shale beads also link Star Carr and the Nab Head into a broader network of Early Mesolithic sites where these artefacts have been found, most of which appear to be of Star Carr type (Table 33.1). Isolated examples are found across southern Wales, as far as Waun Figlen Felen (Barton et al. 1994) in the Black Mountains, and these are likely to have been made at Nab Head. Further examples of shale beads are found across Northern England, from the Pennines at Rushy Brow to the west, Staple Crag in County Durham to the north and Manton Warren to the east. Of these northern sites, Star Carr has the largest number of beads (Table 33.1).

It would be tempting to suggest that Star Carr represents the northern counterpart to the Nab Head; however if it is a manufacturing centre it is on a very different scale to that of the Nab Head, especially given the large excavation areas. It is clear that beads were made at Star Carr, as their distribution is strongly associated with areas where awls were recovered, and areas which can be characterised as workshops focused on craft activities. However, what is more unexpected is that they do not appear to have left their area of manufacture. We might imagine that if beads were discarded here that these would be broken examples, with newly made ones moved elsewhere. This is not the case; while broken beads are present, they are in the minority. The same is of course true of the Nab Head, leading David to speculate that this could be the area of a cemetery (no bone was

**Figure 33.10 (page 474):** Image showing the perforation of amber by a mèche de foret, hafted to a hazel shaft and bound by willow bast, using a sandstone as a support to hold the amber in place (Copyright Aimée Little, CC BY-NC 4.0).

| Site | Material | Number |
|---|---|---|
| The Nab Head I, Pembrokeshire | Shale (691), old red sandstone (1) | >692 |
| Palmerston Farm, Pembrokeshire | Shale | 1 |
| Linney Burrows, Pembrokeshire | Unidentified stone | 1 |
| Freshwater East, Pembrokeshire | Shale | 1 |
| Newquay, Cardiganshire | Shale | 1 |
| Waun Fignen Felen site 6, Powys | Shale? | 1 |
| Star Carr, North Yorkshire | Shale (30) and amber (3) | 33 |
| Staple Crag, County Durham | Shale? | 1 |
| Rushy Brow, Lancashire | Shale | 4 fragments |
| Manton Warren, Lincolnshire | Shale | 1 |
| Thatcham V | Stone | 1 |
| Thatcham VI (Mudhole) | Chalky pebble | 1 |

**Table 33.1:** Stone beads from British Mesolithic sites (data from David 2007, and Wymer 1961). Note the number from Star Carr is now higher.

preserved and shell beads at least in British contexts do appear to be associated with mortuary contexts). Clark discovered much of his bead material in two major clusters, which he suggested might represent lost necklaces, but could equally represent cached material, or depositional foci.

## Conclusions

The procurement of material for bead manufacture likely involved journeys to the coast to collect pieces of amber; however, the role of exchange in amber acquisition cannot be ruled out. The beach may also have been the place where naturally rounded discs of shale, weathered by water action, were collected. It is also conceivable that shale was collected from Star Carr and the surrounding locale directly, with little difference in the weathered discs derived from the glacial till or from the beach.

The close proximity of beads and mèche de foret in the area to the north of Clark's cutting III has been used to suggest a bead production area in that location (Chapter 8). Shale was likely made into beads by an awl, which was hand-held, used with a rotational action and relatively firm pressure. This pattern of working produces a close visual comparison to the perforations evident in the Star Carr beads and represents the most probable method of working. This method resulted in minimal breakage, expedient perforation, and greater control when compared to the hafted alternative. The use of a bone tool, employed in the interests of providing a comparison, was entirely ineffective. In contrast, amber was easy to work with bone tools, creating a small and neat perforation, but this did not match the archaeological signature. Instead, mèche de foret were likely used to drill holes biconically, with tools of a narrower profile shape likely preferentially selected to aid in perforation. The use of a haft increased efficiency when working with amber.

The research undertaken on the Star Carr beads has provided some insight into how they may have been made, yet the microwear analysis of the beads and pendant is inconclusive. Some microwear traces could have resulted from use but clear evidence for use could not be found during the analysis. It is also probable that some information has been lost as a result of recent degradation of the site, possibly obscuring, if not eradicating, evidence of residues such as decorative pigments or vegetal fibres. It remains possible that a larger study, incorporating more of those beads that were excavated prior to the geochemical changes at the site, may hold information lost in more recent finds. However, for these objects there exists a stronger risk of post-excavation contamination and/or loss of residues through washing and curation.

David (2007, 107) noted that mèche de foret were likely not used exclusively for perforating beads and indeed from microwear analysis we know that mèche de foret were used on other (non-mineral) contact materials so are not exclusively bead making tools (Chapter 35). The reverse is also possibly true: beads could conceivably be made by stone tools other than mèche de foret. Initial analyses suggest the pattern made by the mèche de foret is distinct but further testing of similar types of pointed tools is required.

The barely visible engravings found on the pendant, and possibly the backfill bead (if made in antiquity) can provide possible links to the lines exhibited on bodkins and barbed points on the site. Conneller (2011, 83–91) has previously brought into question the extent to which some types of Mesolithic art were intended to be viewed. For example, the practice of engraving the cortex of flint nodules in Mesolithic Scandinavia led to the fragmentation and scattering of art when the nodule was knapped (Conneller 2011, 83–91). Given that the engraving on the pendant is so small, and the piece was almost certainly intentionally deposited in the lake, this question of visibility and audience is perhaps also applicable in this case.

The role and life history of the beads from Star Carr remains obscure. The presence of a unique pendant, made from the same shale, perforated in the same way, and almost certainly a deeply significant piece of art, encourages an interpretation in which beads were more than merely decorative. With the presence of esoteric and performative material culture at Star Carr, with the antler frontlets as possible masks (Chapter 26) being the most dramatic example, beads might reflect another facet of the material touching the social and ritual worlds at Star Carr. On the other hand, the lack of convincing evidence for wear, albeit with taphonomic factors taken into consideration, alongside the evidence for their mass manufacture using mèche de foret, may suggest that the bead assemblage from Star Carr was never intended to be worn by the site's inhabitants. Instead, they may represent items of exchange, connecting Star Carr to the wider Mesolithic world.