



**Archive Mapping
Star Carr**

Archive Mapping Report 2013

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Project undertaken at the University of York and funded by English Heritage (6064 ANL) as part of the project, Star Carr: an excavation to inform future management discussions. The archive mapping project was undertaken by Dr Hayley Saul and directed by Professor Nicky Milner.

Front page: The brushwood found by Clark in 1950

(Photo: courtesy of Scarborough Archaeological and Historical Society).

 **Star Carr**
archaeology project



Background to the archive mapping project

Introduction

Star Carr is an internationally renowned, Early Mesolithic site in the Vale of Pickering, North Yorkshire. It was first discovered by a local amateur archaeologist, John Moore, but became known worldwide after the excavations of Professor Grahame Clark, 1949-1951, due to the well preserved, rare artefacts which were uncovered. More recent excavations by the Vale of Pickering Research Trust (in the 1980s and since 2004), have led to further important discoveries such as a timber platform (the earliest evidence of carpentry in Europe) and a structure (the earliest known “house” in Britain).

One of the biggest stumbling blocks to conducting further research is access to the archive from the earlier excavations. Moore’s paper archive is missing. There is no known paper archive from Clark’s excavations and it is thought that all records must have been destroyed once the monograph (Clark 1954) had been published. The only surviving records are some of the photographic slides which are held in the Museum of Archaeology and Anthropology, Cambridge (MAA) and a small number held by Scarborough Archaeology and Historical Society. In addition, Clark’s excavated assemblage has been dispersed across many museums and there is no over-arching catalogue. The paper archive for the Vale of Pickering Research Trust is being collated by Paul Lane (University of York), but some of the finds appear to have been lost.

Given these problems, it should be no surprise that it has been difficult for recent scholars studying the site of Star Carr to locate all the finds. Due to the current interest in Star Carr by a range of stakeholders, English Heritage agreed to fund a period of archive mapping with the primary aims of locating and cataloguing as much as the material as possible to enable further research and to inform decisions about the future distribution of the archive.

The outcomes of the project aimed:

- To produce copies of catalogues and finding aids of museums and universities holding finds, artefacts and archives relating to the site;
- To produce lists of contacts at each institution and clear instructions as to how future researchers can access the material;
- To assess how/when/where Star Carr material has been exhibited as well as stored and researched;
- To examine what can be deduced about finds conservation (in order to assess whether further dating can be carried out);
- To suggest how the site may be imaginatively interpreted for a range of users, using internet technology.
- To produce recommendations as to the future distribution of finds and archives to facilitate research access;

Brief summary of excavation history

The first phase of fieldwork around palaeo-Lake Flixton was carried out by John W. Moore during the 1940s. Moore walked around the freshly cleaned drainage ditches in the area and in a number of locations picked up worked flint, bone and other material relating to the Early Mesolithic (sites 1-10). In 1948-9 Moore undertook excavation at Star Carr, Flixton 1 and Flixton 2 (Moore 1954). Moore drew his discoveries to the attention of Harry Godwin who was then Director of the Sub-Department of Quaternary Research at the University of Cambridge and who coincidentally was working in the Vale at the time. In 1948 Godwin and Roy Clapham visited Moore's excavations at Flixton and obtained a pollen core from the vicinity (Godwin 1949). Following advice from Godwin and the then curator of Scarborough Museum, Mr T. C. Gwatkin, Moore sent a sample of flints to Grahame Clark at the Department of Archaeology, University of Cambridge (Clark 1954, xviii).

Clark directed excavations over three seasons, each of which was approximately three weeks long: 1949-1951. The quality of finds was extraordinary and included a possible wooden paddle, red deer skull headdresses, large quantities of barbed points, faunal remains and beads. In addition, a large quantity of wood was found on the edge of the lake which was termed "brushwood" and interpreted as some kind of platform on which people would have lived (Clark 1954).

Further work at Star Carr commenced in the 1980s by the Vale of Pickering Research Trust. The main objective of this investigation was to obtain new samples and stratigraphic data from the Star Carr area, which would form part of SERC-funded investigations of the microhabitats, lithology and depositional context of the Star Carr site, by Edward Cloutman and Alan Smith, Department of Plant Sciences, University College, Cardiff. However, archaeology was also uncovered: faunal and lithic material including a barbed point was found in VP85A in association with an area of substantial worked timbers. This was interpreted as part of a deliberately laid platform, differing significantly from the birch brushwood horizon noted during Clark's excavations mentioned above. The wood working analysis by Maisie Taylor suggested that it was the earliest evidence of systematic carpentry in Europe (Mellars et al. 1998).

Since 2004, Nicky Milner and Barry Taylor (University of York), and Chantal Conneller (University of Manchester) have been directing excavations at Star Carr (Conneller 2007; Conneller et al. 2009a, 2009b, 2011, 2012; Milner 2007, Milner et al. 2012a, 2012b, Taylor 2007, Taylor et al. 2010). However, disturbingly, the antler that has been recovered is severely deteriorated and bone has turned to gelatine: the "jellybone" (Boreham et al. 2011, Milner 2007; Milner et al. 2011). The wood that was found was also in a bad state of preservation; however, more worked planks have been found across the site which suggests an extensive platform the likes of which are previously unknown for this period. In addition, on the dry land, evidence for a structure was uncovered which is the earliest "house" known in Britain.

Star Carr was designated as a Scheduled Monument in 2011. In addition, Milner obtained European Research Council funding in 2011 for an interdisciplinary team to undertake five more years of research at the site (2012-2016) to rescue the organic remains before they deteriorate further.



Methods

The main emphasis of this study has been the location of the material excavated by Clark, 1949-1951 because that constitutes the majority of the archive. However, an attempt has also been made to locate the archives generated by John Moore (1948 and 1951) and those generated by the Vale of Pickering Research Trust (1985 and 1989), published in Mellars and Dark (1998).

At the start of this project, a group email was distributed to UK museums and archival institutions via the Society of Museum Archaeologists, which acts as a central node in curatorial networks. Additionally, a list of fifty-five small, local museums was contacted following web-based research.

Museum visits proceeded over the autumn of 2011, spring of 2012 and autumn of 2012, conducted by Nicky Milner (The Museum of Archaeology and Anthropology, Cambridge), Hayley Saul (The Natural History Museum, The Rotunda Museum, Scarborough, Whitby Museum, The Yorkshire Museum), Ben Elliot and Pat Hadley (The British Museum).

A spreadsheet was used for recording artefacts. Clark's original artefact recording system inspired the design of the spreadsheet, since most researchers will approach the Clark archive through acquaintance with the monograph (Clark 1954).

In some cases the code was not marked on the artefact and so the descriptions in the schedules have been used where possible: in some cases it is not possible to be 100% confident of the code. These entries also recorded the artefacts storage location (cabinet number, box number, accession number), a category of artefact type (eg. faunal, floral, flint), and the artefact material. A photographic record was made of all the Star Carr holdings at each museum and photographs were given a unique code that relates them to their museum location.

It quickly became obvious during the museum visits that the amount of faunal remains from Star Carr that are *without* a Clark code is substantial. For the purposes of rendering this mass into searchable categories, two approaches were taken. The first was to allocate classes of artefact by keyword (Appendix II). The keywords vary in the resolution of what they describe, depending on whether or not the artefact could be related to the identified faunal remains in Clark (1954). Similarly, flint cannot be linked directly with the Clark monograph and so we have instead noted where the flint has been located and where possible the quantities.

The collated database of the Clark archive with photographic links will be made available through the Archaeology Data Service. Individual codes (for example, P141, for barbed point 141) can be searched, and will either produce a single catalogue entry at one of the museums, or will state a narrowed range of possible locations/photographs if the coded number was not visible on the artefact. Appendix 2 provides details of the searchable classes and categories of data.



Museum Collections Overview

Moore's archive

There is no trace of any paper archive for Moore's excavations at any of the sites around Lake Flixton. In a letter dated 26th September 1951 to Mr. Smettem of The Rotunda Museum, John Moore asks advice on the disposal of 'five heavy binders of letters, manifolds, and other communications regarding the prosecution of the Star Carr researches from 1947 to 1951'. According to Moore, this paperwork included, 'the contributions of Drs Godwin and Clark along with my many full enquiries and instructions' (SCAR_PAPER_101). Moore was keen to sell this paperwork to Scarborough Museum but the Museum declined the offer and the whereabouts are now unknown. An old acquaintance of Moore has been in touch with the Star Car team because she has been trying to track down more information about him. She has found that there are no living relatives, that Moore did not have a family except his sister, who also had no family, and that neither Moore nor his sister wrote a will.

Moore's artefacts appear to be located in the Scarborough Museum though we cannot be sure whether they all are because there is no paper record to check against. Several receipts for artefacts and letters dated to the later phase of activity in 1951, detail the relinquishment of artefacts to the Rotunda Museum by Moore. Significantly, this includes 12 barbed points amongst a substantial amount of flint and birch bark rolls (SCAR_PAPER_065, SCAR_PAPER_071, SCAR_PAPER_072, SCAR_PAPER_073, SCAR_PAPER_116, SCAR_PAPER_148). There are now only 8 barbed points at Scarborough. In addition, a report states that the finds from Moore's 1948 and 1951 excavations would be retained at Scarborough (SCAR_PAPER_146, SCAR_PAPER_147), though clearly some were relocated.

Most of Moore's artefacts are labelled with a grid reference which locates them spatially. There is some overlap between the Moore and Clark archive because Clark subsumed some of Moore's material into the 1954 monograph, following Moore's excavation of the inter-trench baulks. It is difficult to know whether this material is held at Woodend, Scarborough, as there is no record of the manner of labelling. It seems likely that at least those artefacts given direct attention by Clark in publication would also have received a Clark code. As for less high-profile artefacts from the same areas, it is thought likely that these received a Moore-style grid label and these were observed at Woodend, Scarborough.

Clark's archive

Clarks' monograph provides a wealth of information with chapters on the faunal remains, flint industry, antler and bone industry and miscellaneous finds.

- The faunal remains are broken down into species and each species is described with numbers of different types of fragments (e.g. pelvis, humerus etc) given within the text but it is not always clear whether all the bones have been described: there are no tables and little discussion of the fragmentary bones. Later work by Legge and Rowley-Conwy (1988) quantified the bone fragments in the Natural History Museum, The Rotunda

Museum and the Museum of Archaeology and Anthropology, Cambridge and calculated the total at 1087 bone fragments (not including antler which is also numerous).

- The chapter on the flint states that 16,937 flints were scheduled (85.3% which did not show any signs of modification). There were 248 microliths, 326 end scrapers, 334 burins, 107 awls, and 7 axes. The chapter on antler and bone industry includes red deer antlers, barbed points, red deer antler tools, miscellaneous red deer antler, elk antler mattocks, elk bone, and auroch bone artefacts. This chapter is of particular value because many of these artefacts are extremely rare but in addition each artefact/ecofact has been assigned a unique code: it has therefore been a focus of this project to locate their whereabouts. For each category of bone and antler type, Clark created a schedule within the book: each artefact/ecofact is listed by code and a brief description is given. The section on barbed points is particularly detailed and it was thought that there was a drawing or a photograph of every single barbed point found. However, on conducting this archive research, it was found that only a sample had been illustrated. Many of the barbed points in the collections are not labelled with Clark's code: in some cases, if they were not illustrated in the book, the description in the schedule was used as a way of identifying them.
- The chapter on miscellaneous finds includes beads and pendants, birch-bark and birch-pitch, haematite, iron pyrites, worked stag frontlets, stone pebbles and wood.

In Clark's monograph (1954) in a note at the end of the introduction (pg., xxiii) he records the disposal strategy for finds from the excavations undertaken from 1949-1951 (see appendix 1). The British Museum (Natural History), received the majority of the bone and antler artefacts, along with a characteristic series of flint work. 'A series of artefacts' were placed in the Department of British and Medieval Antiquaries at Bloomsbury. The Rotunda Museum, Scarborough acquired a 'representative series' of antler and bone, as well as some outstanding pieces and the complete assemblage from John Moore's primary excavations at Site 1 and 2. 'The residue' of the faunal artefacts, plus flint waste, was deposited with the University Museum of Archaeology and Ethnology at Cambridge.

These museums retain the majority of the artefacts though some changes have been made in terms of storage location and some of these collections have been split further. The British Museum collections are held at Franks House (Whitmore Road, London). Those at the Natural History Museum are split between the Mammals Group in the Department of Zoology which holds the majority of the faunal remains, and the Department of Anthropology which retains 21 barbed points and a small collection of flints. The Scarborough collections are located at the Scarborough Museum Trust store at Woodend, Scarborough.

It would appear that in the 1950s, with an increasing realisation of importance of the site, the Star Carr assemblage was further subdivided and loaned to other museums around the UK. Further information has been ascertained through the surviving paper record at The Rotunda Museum, Scarborough, which includes letters, newspaper clippings and receipts. A portion of the paper archive testifies to several short-term loans to other UK museums and school groups for exhibition and educational purposes, and the creation of replica casts of, for example, some of the barbed points.

This information and contact with a number of museums provided the following information:

- The documentation records the delivery of two fragments of bone harpoon to the City Museum in Leeds (SCAR_PAPER_150). Through correspondence with the museum they no longer appear to have these artefacts.
- The documentation also records exchanges of harpoons with the Tolson Memorial Museum in Huddersfield (SCAR_PAPER_153, SCAR_PAPER_157, SCAR_PAPER_158, SCAR_PAPER_159). However, again through recent correspondence, it turns out that this museum no longer has these artefacts.
- Whitby Museum (North Yorkshire), still retain a small collection, loaned to the museum when the Reverend C. C. Fowler was assistant curator in the early 1950s (SCAR_PAPER_174, SCAR_PAPER_175, SCAR_PAPER_176, SCAR_PAPER_181, SCAR_PAPER_182, SCAR_PAPER_192).
- Kirklees Museum (West Yorkshire) have a box labelled 'Star Carr'; however, this turned out to be a single flint artefact, from the locality of the former Lake Flixton in the Vale of Pickering, but not part of the Clark or Moore excavations.
- The Scarborough Museum paper archive refers to several incidences of ecofact 'castings' being made, and notes that these were distributed between institutions and schools along with the artefacts themselves. Some replicas were identified during the researches. Scarborough holds two replica barbed points (SC_SCAR_040, SC_SCAR_041), and the Yorkshire Museum collection contains a replica of the elk antler mattock (SC_YM_011, SC_YM_012).
- Hull Museum have located some objects recorded as coming from the 1951 excavations. They have been donated by a Mr G. Price of Hull. We do not know who he was or how these objects came to be in his possession. The collection consists of 3 pieces of flint, an antler tine and a case of an elk mattock.
- There is a small collection in the National Museum of Ireland (found during research by Dr Graeme Warren). It consists of 15 pieces of flint and a piece of antler.

Overall, the majority of Clark's core (labelled) archive has been located. Based on the researches to date, the distributions of artefacts from Clark's (1954) monograph are detailed below:

<i>Clark's artefact category</i>	<i>Clark's Code</i>	<i>The British Museum</i>	<i>The Natural History Museum</i>	<i>Cambridge Museum of Archaeology and Anthropology</i>	<i>Yorkshire Museum</i>	<i>Whitby Museum</i>	<i>Scarborough Museum</i>	<i>National Museum of Ireland</i>	<i>Hull City Museum</i>	<i>Original number</i>	<i>Total located</i>	<i>Difference (missing)</i>
Antler and bone		4	3029	148	2	1	29	1	1			N/A
Worked antler	A		57	1						104	59	45
Antler tines	AT									9	0	9
Antler miscellany	AM			1						3	1	2
Antler splinter	S		1	3						4	4	0
Antler frontlets	AF	1	18	1			1			21	21	0
Barbed points	P	4	24	129	1		8			191	166	25
Elk antler mattock	EM	1	1	4						6	6	0
Elk antler hammer	EH		1							1	1	0
Elk antler tine	ET									1	0	1
Elk bone bodkin	EB	1	1	6						8	8	0
Elk bone baton	EB			2						2	2	0
Worked auroch metatarsal	XB			3						11	3	8
Worked auroch metacarpal	XC			3						4	3	1
Bird bone bead	B			1						1	1	0
Amber beads			1	1						3	2	1
Shale beads		2		23						25	25	0
Tooth bead	Tb1									1	0	1
Flint		Y		Y	Y	Y	Y	Y	3	16,937		N/A
Birch bark rolls			1	1	3		29			?	34	?
Wood			1									N/A
Haematite										some	0	Y
Iron pyrite										4	0	4

Of those objects still to be found, the majority are pieces of worked antler and barbed points. It is possible that some of the worked antler is mixed in with the mass of other faunal remains held at the Natural History Museum. The codes are not always clearly visible and a detailed analysis of the bone and antler was not possible. Therefore, the number of missing 'worked antler' may not be as large as appears in the table.

Although it would appear that there are 25 barbed points missing, from a close reading of the report in Clark's monograph it would appear that 15 that we cannot locate were noted by

Clark as being extremely deteriorated. There were others in the MAA which were blackened and shrivelled at one end, but a large enough portion of them was in fair to good condition and presumably was retained for this reason. We have to consider the possibility that Clark disposed of the deteriorated 15 because they had no value. If this is the case, there are only actually 10 missing in total. We also think it possible that the missing P180 and P188 were originally in Scarborough Museum but had been loaned out and never returned (many of the barbed points went to museums in batches and Scarborough seem to have a number from P178 onwards). It should also be noted that it was very difficult to assign some barbed point fragments to P numbers because there are no existing images and we have to go off a description in the report: it may be that there are some which have been misidentified, though in general we are confident that most numbers are correct.

There is only worked piece of elk antler that appears to be missing. There are however, 9 pieces of worked auroch which currently cannot be accounted for. Again, they may be residing in the collection at the NHM along with the pieces of bone and antler which have not been worked.

We do not know how many birch bark rolls were discovered but a good number have been located in this study. It was surprising to find wood at the NHM as no mention is made of collecting any.

There appear to be 2 beads which are missing. One is made of amber and the other is a perforated animal tooth. The haematite and iron pyrite appears to be missing although it is likely to be in the British Museum as this is where it was initially sent (though to the Department of Mineralogy).

It is impossible to know at this stage what flint is not housed in these museums. It has not been possible to count them all up but the study shows that a lot of flint was relocated to other museum stores and it is likely that there are many other museums where small collections reside.

Overall, the study has not 'found' all the artefacts but it has located the majority of them. There is still the possibility that others may be located. In addition, overseas loans cannot be ruled out: Clark acknowledges the contributions of numerous international collaborators (National Museum in Copenhagen, National Museum in Helsingfors, the American Museum of Natural History in New York, and the Institut de Paléontologie Humaine, Paris) in registering the significance of Star Carr in its European context. These museums have not been contacted in this study.

VPRT collection

The 1985 and 1989 excavations at Star Carr were small in comparison to Clark's excavations but they still produced a range of finds (see Mellars and Dark 1998). There were 22 fragments of bone, 10 major pieces of red deer antler and one of roe deer and a barbed point. In addition, 10 samples of wood were lifted for further investigation. Overall, a total of 427 pieces of flint was found. A number of environmental samples were also lifted including a block of peat.

The material archive is located in two places. The flint is held by Professor Paul Mellars in Cambridge. The block which was lifted for excavation in the lab was thrown away (Hadley et

al. 2010). The cores taken by Petra Dark are still housed in storage in Cambridge and were recently studied again (Boreham et al. 2011).

The remains of the organic artefacts and ecofacts are currently housed in the labs in the Department of Archaeology, University of York. Unfortunately some of the organic artefacts appear to have been lost, possibly when a fridge malfunctioned at the University of Durham where the material was being housed following its examination, as written up in Mellars and Dark (1998).

In 2010, all of the extant organic artefacts and ecofacts were brought to the University of York from the University of Durham for integration with the rest of the archive. There are three boxes of wood which have been conserved. There are only 2 bones and a couple of pieces of birch bark.

The paper archive from the excavations is currently being curated at the University of York by Dr Paul Lane with the intention of depositing it in ADS. We are currently in discussion with The Yorkshire Museum regarding the deposition of the remaining artefactual collection.

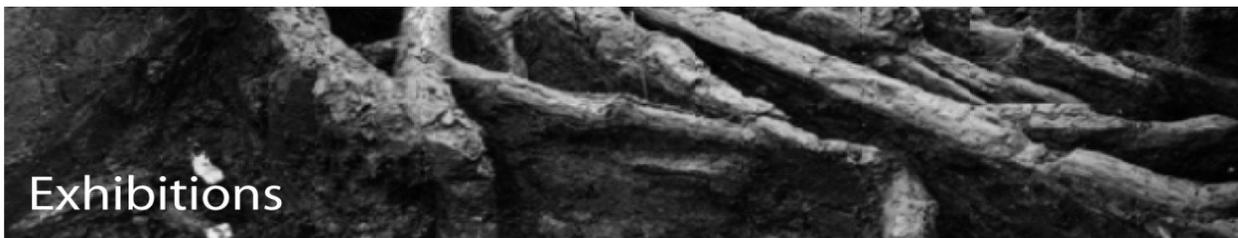
The more recent excavations since 2004 have also generated paper records and artefactual collections. These are currently being curated at the University of York. At the end of the Star Carr excavations in 2016, a full digital archive will be deposited in ADS. It is intended that the paper record from the project will be deposited with The Yorkshire Museum.

The finds are currently in the ownership of the landowners. The Yorkshire Museum has offered to curate them, should the landowners wish to pass on ownership.



Grahame Clark records the use of an on-site impregnator for conserving the delicate organic materials. The synthetic resin used in the process is recorded as plasticized polyvinyl (PVC) in a letter (SCAR_PAPER_180, SCAR_PAPER_181) from the Reverend C. C. Fowler (Assistant Curator of Whitby Museum) to Cambridge. Clark (1954, xxiii) notes that, 'the whole of the archaeological material passed at one time or another through the University Museum of Archaeology and Ethnology at Cambridge', for the purposes of conservation. This intense conservation agenda was evident at all the museums visited: it seems that the only substantial portion of the assemblage *not* conserved with PVC was the many birch bark rolls now archived at Scarborough Museum.

The material from the 1980s excavations has not been conserved, with the exception of some of the wood. However, this is now in fairly bad condition. There are yellow crystals forming and the boxes smell of sulphur. Some of the wood is extremely crumbly.



Former and current exhibitions

Currently, one of the antler frontlets is on display at the MAA in Cambridge. Similarly, an antler frontlet and two barbed points are on display at the British Museum. The majority of the faunal collection (fungus, moss and antler splinter), and a small portion of the flint at Whitby are on display. At the Yorkshire Museum, the barbed point is on display.

Records show that some material from Star Carr has previously been on display at The Rotunda Museum and the Natural History Museum, although both these institutions now only house artefacts in storage.

In 2010, the Star Carr project collaborated with the Yorkshire Museums Trust and Science City York, to invite a group of artists to represent the Star Carr archives in a project entitled "Artists in the Archives". The York City Art Gallery played host to an artistic interpretation of the site through its archive: displays were themed on the character of archival storage spaces, engaging the public to discover the site themselves with techniques to activate the curiosity of historical discovery: cabinets to open, drawers to explore, divided spaces to investigate. The personal explorations were undertaken alongside film clips of Star Carr project team members describing on-site discoveries, and the process of investigation from a professional standpoint.

In 2012 a Star Carr festival was held in Woodend Creative Space, in partnership with Scarborough Museums Trust and York Archaeological Trust. This included talks by Nicky Milner, storytelling by Ben Haggerty (author of the graphic novel *Mezolith*), activities for children (such as making footprints and casts and making arrows) and trips into the stores to see the Star Carr artefacts. Over 120 people attended this festival and feedback was overwhelmingly positive.

Future exhibitions

The Star Carr Project team is collaborating with the Yorkshire Museums Trust to develop an exhibition for May 2013 in the Yorkshire Museum. This will incorporate novel artistic and sensory expressions of the Star Carr site and its locality through diverse media: as well as artefact displays and information boards, localised 'soundscapes' will be projected into the exhibition space, to replicate the Lake Flixton environs in the Early Mesolithic. Sound technician Jon Hughes will be working with Star Carr Project team members to record these authentic soundbites, which will also be sampled and developed into a musical score with classical instrumentation: an ambisonic sound system of speakers will form a globe of sound 30m in diameter playing the musical score to audiences positioned inside the ring.

As part of the wider initiatives of the Yorkshire Museum in the run-up to their exhibition, students from the University of York Archaeology Department will be interviewing Star Carr project members from multiple generations of excavation, reaching back to the original explorations by John Moore and Grahame Clark. The oral histories will be included in the

museum exhibition, as well as being accessible through the Archaeology Data Service. Students will also be involved in promotional activities through the museum's blog, encouraging dialogue between their researches into the paper archive and oral histories, and the wider public.

The project team are also working with Whitby Museum and Ryedale Folk Museum on exhibitions on Star Carr and Lake Flixton.

Imaginative interpretations of the site

Visual interpretations of the Star Carr site are a key axis for engaging the wider public's interest in ongoing research. To this end, the project is commissioning visually striking representations of the excavated material, through reconstruction. Two artists are engaged in the interpretive process of making coherent the fragmentary remains; Kerrie Hoffman and Dominic Andrews. Their work will be used in popular literature aimed at community outreach.

We are also keen to trial digital reconstruction which can then be used in museum exhibitions or uploaded onto websites. Anthony Masinton (University of York) is currently working on a digital 'fly-through' of the Lake Flixton and Star Carr in order to help people visualise what the landscape would have looked like 11,000 years ago.

In addition, during the 2012 season of fieldwork three-dimensional imaging was successfully applied to trench features. Following on from this, the same programme (*Agisoft, Photoscan*) is being used to create three-dimensional renderings of artefacts, with photographic reality. The technique is a form of photogrammetry that utilises a cloud of images taken from varying, but not regular, angles and intervals. Automated recognition of common points or features is performed, and their position in three-dimensional space is triangulated. The result is a rotating model of the artefact from all imaged angles, in .pdf format. The procedure is substantially more automated than conventional photogrammetry, lending the technique to large scale application of diverse archaeological objects, both in the field and in post-excavation.

To fully realise the potential of digital developments such as these, the Star Carr project is generating three-dimensional image datasets for in-house artefact collections that could be made into an 'iMuseum'. Prospects for hosting this through ADS, the Star Carr Project website, or through museum websites where current material displays are exhibited are being explored.



Recommendations for the future

This project has enabled researchers to have a much better idea of where the artefacts and paper records are held and whilst there are some challenges because of the travelling that is involved between so many museums, it is now possible to know where to go.

When we give talks to local societies, we are often asked where the material is. At a recent talk, someone suggested that it was all brought back to Yorkshire! This is unlikely to be

feasible but it is important that material is displayed locally and we are collaborating with the Yorkshire Museum, The Rotunda and Whitby Museum to facilitate this. Even when material is not on display in the Museum, we have found ways of making it accessible, for instance, Karen Snowden (curator at Woodend, Scarborough) has brought material to talks and has allowed access through store tours.

The plan to deposit material in The Yorkshire Museum in the future has arisen through discussions with both The Yorkshire Museum and Scarborough Museums Trust. The stores at Woodend in Scarborough do not have the capacity for further deposition and there is little room for conducting research. It was suggested by the Chief Executive of Scarborough Museums Trust that the material would be better placed in a museum which could provide research facilities. The Yorkshire Museum has a number of research and educational spaces and staff who could help deliver education to interested parties including school groups: there is therefore significant potential for further public engagement through this museum.

We are also keen to work with all the museums which house material from Star Carr, providing information and ideas for exhibitions and knowledge dissemination. We have recently published a booklet entitled the Story of Star Carr, and plan to publish a popular book with the Council for British Archaeology this year. In addition, the Star Carr project will be featured on a Time Team special in 2013. There is the opportunity to build on these various activities and engage the public in this important site, through a variety of media and museums can play an important role in this.

Finally, we would welcome further information on the 'missing' artefacts and hope that this study will bring to light new data that can be incorporated into the database.



Through the ADS website it will be possible to find information on artefacts, ecofacts and archives relating to the site. This will include links to museums and clear instructions as to how future researchers can access the material, as well as providing information on exhibitions and where to view materials. The website will also include a resource explaining what research has been carried out, and provide a reading list.

It is hoped that the museums that curate parts of the site will be keen to continue to promote the site in the future. The ADS website will act as an important hub of information and will guide researchers and interested members of the public to a range of museums across the country.

Ideally, we would like to continue to find ways of making material accessible to as many people as possible. A large proportion of the potential audience do not live in the UK: Star Carr is taught in Universities around the world, and the press release on the 'Earliest house in Britain' was broadcast globally via newspapers, radio and TV. We get letters and emails from people in many different countries. The development of an 'iMuseum' would help to provide the global audience with further information not normally accessible unless they visit the UK. We are keen to continue our collaborations with the Museums and ADS and to discuss how best to progress.



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Appendix 1

DISPOSAL OF FINDS

With the generous concurrence of the landowner, Mr C. A. Midgley, the finds have been divided among the institutions which have carried the main burden of the work, namely the British Museum, the University Museum of Archaeology and Ethnology at Cambridge, and the Corporation Museum at Scarborough. The best of the bone and antler artifacts, together with a representative series of the worked flints from the 1949 season, have gone to the British Museum (Natural History), in which the bulk of the faunal remains have also been deposited; in addition, a series of artifacts has been placed in the Department of British and Medieval Antiquities at Bloomsbury. A representative series of antler and bone artifacts and some outstanding exhibits of faunal remains have been presented to Scarborough Museum, where is also housed the whole of the material obtained by Mr Moore from Sites 1 and 2. The residue of the archaeological material, including the complete flint 'waste' from the 1951 season, has been deposited in the University Museum of Archaeology and Ethnology at Cambridge. Samples collected by Dr Godwin and his assistants and slides prepared for pollen-counts are housed in the University Sub-department of Quaternary Research in the Botany School, Cambridge.

Appendix 2

Keywords were allocated according to:

<i>Class</i>	<i>Categories</i>
<i>Artefact material</i>	Red deer antler Elk antler Elk bone Urus bone Bird bone Antler Horn Bone Animal tooth Amber Shale Birch bark Antler/Bone Fungal Paper archive Stone
<i>Artefact type</i>	Worked antler Barbed point Antler tine(s) Antler splinter Antler mattock Antler hammer Bone bodkin Bone baton Amber bead Shale bead Birch bark roll(s) Antler frontlet Stone pebble Fungus Moss Bead Worked metapodial Worked metatarsal Worked metacarpal Worked animal tooth Worked bone Vertebra(e) Mandible Cranium with horn Rib Bird bone Cranium Cranium with antlers

Tooth
 Teeth
 Scapula
 Metatarsal(s)
 Pelvis
 Proximal metacarpal
 Distal metacarpal
 Ulna or radius
 Tibia
 Maxilla
 Foot bone
 Long bone
 Short bone
 Large mammal long bone
 Small mammal bone
 Large mammal femur

 Antler
 Bone
 Horn
 Flint
 Fragments

A supplementary 'Species' category was also included, where the species was known. The second means of making Clark's un-coded artefacts searchable was the production of broader browsing categories for the Artefact Types, with hyperlinks to collections of photographs. These broader groupings were created under the headings:

<i>Hyperlink category</i>	<i>which includes the Artefact Types:</i>
Worked antler artefacts	Worked antler Antler tine(s) Antler splinter
Barbed points	Barbed points
Antler mattocks and hammers	Antler mattocks
Antler frontlets	Antler frontlets Antler hammers
Bone tools	Bone bodkin Bone baton
Worked bone artefacts	Worked metapodial Worked metatarsal Worked metacarpal Worked bone Worked animal tooth
Aesthetic tools	Amber bead Shale bead Bead Antler frontlets

	Bone baton
Floral and fungal	Birch bark rolls Fungus Moss
Antler and horn remains	Antler Horn Cranium with antlers Cranium with horn
Bone remains	Bone Vertebra(e) Mandible Rib Bird bone Cranium Fragments Long bone Tooth Teeth Scapula Metatarsal(s) Pelvis Proximal metacarpal Distal metacarpal Ulna or radius Tibia Foot bone Small mammal bone Large mammal femur Large mammal long bone Short bone Maxilla
Stone tools	Stone pebbles Flint