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Scales of analysis: Evidence of fish and fish processing at Star Carr

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ABSTRACT

This contribution directly relates to the paper published by Wheeler in 1978 entitled 'Why were there no fish remains at Star Carr?'. Star Carr is arguably the richest, most studied and re-interpreted Mesolithic site in Europe but the lack of fish remains has continued to vex scholars. Judging from other materials, the preservation conditions at the site in the late 1940s/early 1950s should have been good enough to permit the survival of fish remains, and particularly dentaries of the northern pike (*Esox lucius* L., 1758) as found on other European sites of this age. The lack of evidence has therefore been attributed to a paucity of fish in the lake. However, new research has provided multiple lines of evidence, which not only demonstrate the presence of fish, but also provide evidence for the species present, data on how and where fish were being processed on site, and interpretations for the fishing methods that might have been used. This study demonstrates that an integrated approach using a range of methods at landscape, site and microscopic scales of analysis can elucidate such questions. In addition, it demonstrates that in future studies, even in cases where physical remains are lacking, forensic techniques hold significant potential.

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1. Introduction

Grahame Clark excavated Star Carr from 1949 to 1951 (Clark, 1954) (Fig. 1). His discoveries have led to what has become known as one of Europe's most famous Mesolithic sites. This was due to the outstanding preservation of organic remains, including the discovery of a brush-wood platform associated with an extensive faunal assemblage and extremely rare artefacts such as 'headdresses' made from the crania of red deer (*Cervus elaphus* L., 1758). Clark noted that:

'No remains of fish survived. Negative evidence is notoriously dangerous in prehistory, and never more so than when a substance so perishable as fish-bone is in question. Yet to judge from what was found on similar sites in different parts of northern Europe, traces might at least have been expected for the lower jaws of pike, had these been caught. It should be remembered though that the evidence for pike-fisheries among the later Maglemosian comes from sites occupied during the summer, in the early months of which the fishing was carried on with leisters in temperate Europe down to modern times. The absence of pike remains from Star Carr may

therefore be a true reflection of the circumstance that the site was abandoned during the summer months'.

[Clark (1954, 16, our emphasis)]

In the 1970s and 1980s a number of articles reinterpreted the evidence from Star Carr, in particular reconsidering the seasonality of the site and importantly, suggesting that the site had been occupied during the spring and summer (Carter, 1998; Caulfield, 1978; Jacobi, 1978; Legge and Rowley-Conwy, 1988; Mellars and Dark, 1998). This overturned Clark's hypothesis, as set out above, and with new interpretations of summer occupation, it became even harder to account for a lack of pike at the site.

In 1978, Wheeler, wrote a seminal paper entitled 'Why were there no fish remains at Star Carr?'. Importantly, he drew attention to the fact that pike can be fished all year round, which negated the seasonality argument. Therefore, he suggested that there were probably no fish present in the lake throughout the course of site occupation. His hypothesis was that fish, attempting to colonise up the riverine systems, would not have permeated the Lake Flixton basin because the water was too fast flowing at Kirkham Gorge, located roughly 40 km downstream.

However, Wheeler (1978) did not mention the presence of water-fowl, which can transport fish spawn via their feet. The Star Carr faunal

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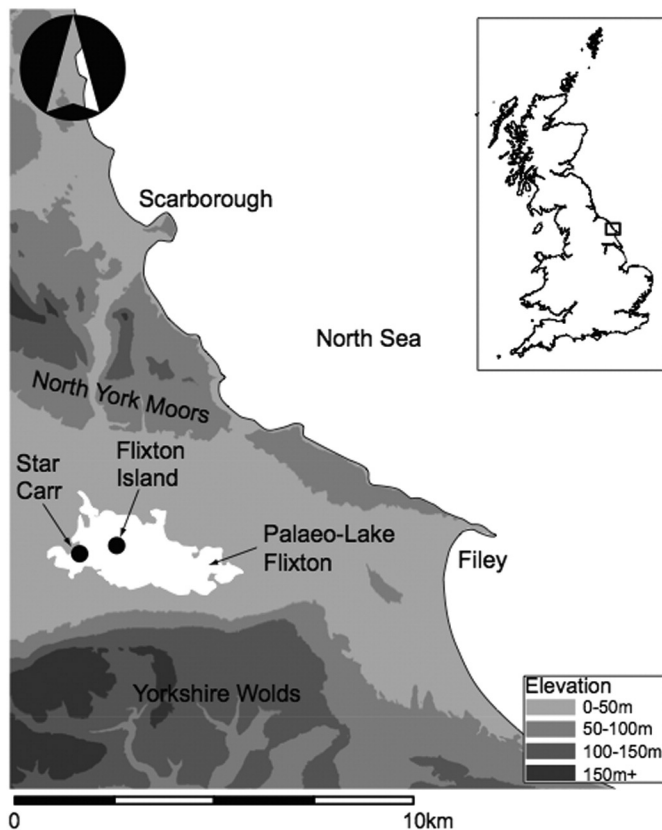


Fig. 1. Location map of Star Carr.

assemblage contained at least seven species: white stork (*Ciconia ciconia* L., 1758), common crane (*Grus grus* L., 1758), red-breasted merganser (*Mergus serrator* L., 1758), red-throated diver (*Gavia stellata* P., 1763), great crested grebe (*Podiceps cristatus* L., 1758), little grebe (*Podiceps ruficollis* P., 1764) and a duck of similar size to the pintail (*Anas acuta* L., 1758) (Clark, 1954). Thus fish could have colonised the lake via this method of passive dispersal.

The only potential (indirect) evidence for fishing is in the form of the barbed points. Clark found 190 barbed points and 1 harpoon at Star Carr (Fig. 2). These were made out of red deer antler and manufactured so that they could be hafted onto wooden shafts for spearing or throwing. In some cases they may have been hafted in pairs or with the addition of a central bone point to provide a leister as has been observed at other sites in Europe: one such pairing of barbed points was observed by Clark in situ (Clark, 1954, plate 12).



Fig. 2. A range of the different types of barbed points/harpoons found at Star Carr including the harpoon in the middle (scale: 5 cm).

Further evidence for the use of barbed points and harpoons related to fishing practices derives from a number of other Early Mesolithic ('Maglemosian') sites in north-west Europe: Holmegård, Lundby, Mullerup, Ulkestrup Lyng, Sværdborg, Vinde-Helsing and Øgaarde (in Denmark) and Duvensee, Friesack 4, Friesack 27a, Hohen Viecheln and Wustermark (in northern Germany) (Aaris-Sørensen, 1976; Broholm, 1924; Clark, 1948; Gramsch and Beran, 2010; Groß, 2014; Jessen et al., 2015; Noe-Nygaard, 1995; Robson, 2015; Rosenlund, 1980; Schuldt, 1961). In addition, fish remains were also encountered at the majority of these sites and are solely pike, or pike dominant. However, wels catfish (*Silurus glanis* L., 1758), European perch (*Perca fluviatilis* L., 1758), tench (*Tinca tinca* L., 1758), carp (Cyprinidae sp.), common bream (*Abramis brama* L., 1758), common rudd (*Scardinius erythrophthalmus* L., 1758) and European eel (*Anguilla anguilla* L., 1758) have also been identified (Aaris-Sørensen, 1976; Broholm, 1924; Gramsch and Beran, 2010; Groß, 2014; Jessen et al., 2015; Noe-Nygaard, 1995; Robson, 2015; Rosenlund, 1980; Wundsch, 1961).

In addition, there is a close correlation between pike remains and barbed points, similar to those found at Star Carr. For instance, at Sværdborg, Denmark, 80 upper and 64 lower pike jaw bones were found along with 274 leister prongs and 11 hooks (Clark, 1952, 47). There are also sites where barbed points have been found in association with pike bones within the lake bed. Clark (1948, Appendix 1) lists Calbe (Germany), Esperöds Mosse (Scania), and Kunda (Estonia). In two cases at the latter site barbed points were found impaling pike skeletons: one in the back of a large pike and the other in the skull (Clark, 1952, 47).

In comparison, there is very little evidence in Britain for freshwater fishing, particularly in the Early Mesolithic. The only comparable example to the European evidence appears to derive from nearby Holderness: in 1903 an antler harpoon was found at Atwick, East Yorkshire and in 1932 further investigations were carried at the nearby site at Skipsea by Godwin and Godwin (1933, 39) who found 'fragments of *Pinus* bark, fins of pike (*Esox lucius*) and flint artifacts'.

In the later part of the British Mesolithic evidence for fishing freshwater species exists but these specimens are not found alongside barbed points: for example a single precaudal vertebrae of a pike was found at Bouldnor Cliff on the Isle of Wight (Momber et al., 2011, 52) and from the Severn Estuary Mesolithic sites a total of 513 identifiable fragments of fish were found including Salmonidae (salmon family), eel and a possible cyprinid (Cyprinidae sp.) as well as coastal species (Bell, 2007, 166–168).

The reason for the lack of fish remains at Star Carr has therefore remained a mystery that has intrigued scholars and members of the public alike. A possible explanation for the absence of fish remains at Star Carr could be that Clark did not sieve the sediments, meaning that small specimens may have been missed. Sieving was not a common practice at the time; peat is extremely difficult to sieve because it is highly organic and does not easily pass through a sieve and therefore it is perhaps unsurprising that this was not attempted.

Renewed research since 2004 (Conneller et al., 2012; Milner et al., 2013) has provided further opportunities to test for the presence of fish remains at the site. Initially, it was considered highly unlikely that any fish remains would be found, even with sieving, due to the extremely acidic sediments that have formed over the last couple of decades (Boreham et al., 2011; High et al., 2015). Some bone and antler has become 'jellybone': the mineral has dissolved in the acidic peat and the collagen has turned to gelatin (Milner et al., 2011a). Furthermore, quantities of bone and antler are extremely low when compared to Clark's faunal collection, suggesting that much of this material has completely disappeared (Milner et al., 2011a).

During the last four years, three different lines of evidence have at last provided definitive evidence that not only a range of fish species were present in the lake, but that they were caught and processed by humans. Significantly, these lines of evidence came from completely different scales of analyses:

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