

The mammoths of Cerney Wick

Last December four million people watched Sir David Attenborough engage with mammoths in Gloucestershire. Their remains were found in a quarry along with a flint handaxe. But could it be shown that Neanderthals had been at the ancient riverside at the same time as the giant mammals? Lisa Westcott Wilkins & Joshua T Hogue report



For Sally and Neville Hollingworth, April 13 2017 started out like any other day. With sandwiches and flask of tea, they left their home in Swindon to explore a quarry. Little did they know that by lunchtime, they would have found something of great scientific importance: a handaxe, lying atop a spoilheap newly created by a digger's bucket.

The couple have made a life's work of enthusiastic "fossiling", and Neville, who has a PhD in geology, often advises the owners of Cerney Wick Quarry, when flora and fauna appear during gravel extraction. The quarry had intrigued the Hollingworths on several previous visits, yielding huge quantities of the Jurassic marine fossils that are their primary interest, along with well-preserved mammoth remains including a femur, tooth, humerus, pelvis and several tusks.

On its own, a handaxe is not that

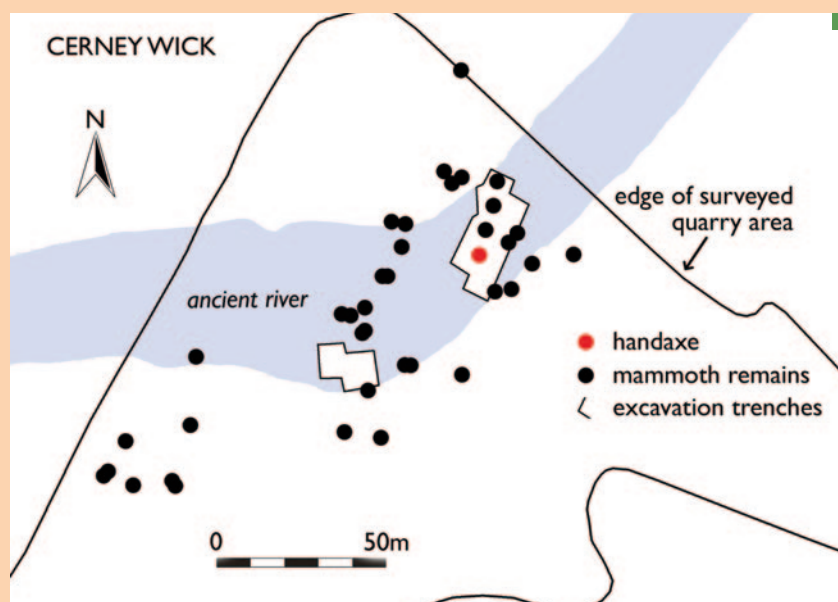


startling a find for a quarry in southern England. However, a combination of factors – the proximity of the artefact to mammoth remains, the amount, variation and very high preservation of the bones, and the location of the finds within a palaeochannel (a remnant of a once active stream or river) – led Sally and Neville to realise they had found something special that needed immediate scientific advice.

“I still remember my reaction to the first photos Sally sent,” says Ben Garrod, professor of evolutionary biology & science engagement at the University of East Anglia, whom the Hollingworths first contacted. “It was jaw dropping in so many ways – the sheer number of fossils, fantastic preservation, obvious great age of everything, and presence of undisturbed strata containing lots of biological remains that was clear even from the photos taken on Sally’s phone. Never mind that it was located outside Swindon, rather than somewhere these

Above: In a scene imagined for a BBC film about the dig, Neanderthals hunt mammoths drinking at a river over 200,000 years ago

Right: Plan of investigated quarry area at Cerney Wick; Hills Quarry Products pumped the site clear of water to allow investigations to proceed



kinds of things are more common! In this context, the handaxe was truly heart stopping. I booked the next possible train to go see everything for myself.”

Garrod is an experienced and enthusiastic science communicator, author and presenter. The Hollingworths had seen him on stage

at the Cheltenham Science Festival, and they felt strongly that he had both the scientific expertise and the approach they visualised for any further work at the site. “We wanted maximum involvement,” says Sally, “a democratic process, and above all, to ensure that there would be as much public engagement as possible throughout



the project. We felt Ben was the perfect match to help us reach the right people.”

After confirming the site potential with colleagues, Garrod contacted DigVentures (DV). “I’d worked briefly with DV in 2016,” he says, “and really clicked with their way of doing things, particularly the focus on innovation. They are top-notch in terms of the standard of fieldwork, but Cerney Wick needed so much more than that. First, we needed to raise the money to dig, and that’s no small task, so it really helped that DV is experienced at fundraising. Second, because the BBC, Windfall Films and Sir David Attenborough were already involved, I knew that the level of collaboration required would be very high, along with the willingness to hand over a substantial amount of narrative control. Finally, there were pressures around the quarry’s planning requirements that meant our timescales had to be tight as well as ultra-flexible. That kind of scenario is a perfect storm of stress for teams, and we needed to really trust each other.”

Now, more than four years into the project, Garrod says that his understanding of archaeology, and

Above: Sally Hollingworth with the flint handaxe she found in 2017; the discovery led to a TV film and an excavation funded by Historic England’s Heritage Protection Commissions

Right: David Attenborough and Ben Garrod during filming of Attenborough & the Mammoth Graveyard, with animal remains collected at the Cerney Wick quarry by the Hollingworths

Below: The flooded quarry at Cerney Wick

archaeologists, has been transformed. “I had no real idea of how much goes into an archaeological excavation,” he says, “especially the technical processes and strategic decision-making around where to target trenches. Witnessing that, as well as depth of knowledge through the scientific and academic contributors that DV pointed at the site, was extraordinary, and a real thrill to be part of.”

The quarry

The Oak Tree Fields quarry pit is located within the Cotswold Water Park on the Gloucestershire-Wiltshire border. Owned and operated since the 1980s by Hills Quarry Products, the pit provides river terrace products from what is known as the Northmoor Sand

series of shell- and organic-rich silts and sands, yielding abundant plant macrofossils, molluscs and insects, alongside many large mammal bones.

It was by one of these palaeochannels that the Hollingworths found the first mammoth remains, including many tusks, exposed on the surface by quarry workings. Near the bones was the Acheulean handaxe, the first tantalising hint of early human activity in the area a significant find for the upper part of the Thames Valley. Indeed, given Cerney Wick’s location at the headwaters of the River Thames, the site offers the potential for understanding connections between well-known finds further downstream, at Stanton Harcourt, Ebbsfleet (feature Jan/Feb 2005/80), Stoneham’s Pit and Crayford,



& Gravel Member. Underlying this are Jurassic clays of the Kellaways and Oxford Clay Formations, into which the former river channels were cut and have subsequently been infilled with a

and others at the northern extremities of early human occupation of Britain such as Pontnewydd in north Wales.

In Britain handaxes are typically associated with the Lower Palaeolithic, most often dating from warm stages within the Pleistocene (the Ice Age) between around 525,000–300,000 years ago. They are largely thought to have fallen out of use during the subsequent Early Middle Palaeolithic. During this period of temperate climate (260,000–180,000 years ago, Marine Isotope Stage 7) much of the archaeological record is dominated by Levallois stone technology. This is when the mammoths died at Cerney Wick. However, inspection of the surfaces and edges of the handaxe showed that it was only slightly abraded: it was unlikely to have moved far from



its original context. Could it then have been associated with the mammoths, an unusually late date for such a technology?

Funding for this type of Palaeolithic work is a challenge, with high costs for dating, conservation of finds and study of biological remains. We were very fortunate to receive over £100,000 from the Historic England Heritage Protection Commissions Programme. This allocates emergency funding to investigate unforeseen nationally significant heritage assets revealed during the planning process, such as the Bronze Age pile village at Must Farm, Cambridgeshire (*News*, Sep/Oct 2016/150).

A programme of survey and targeted excavation was designed by DV and our project partner, Keith Wilkinson,



Above: Keith Wilkinson, University of Winchester (right), surveys the site



Above: Mammoth tusk in situ (scale 2m)

Left: Mammoth remains from the Cerney Wick quarry



professor of geoarchaeology and director of ARCA at the University of Winchester, and agreed with Historic England. We had two main objectives: first, to refine understanding of the site's formation processes, and second, to reconstruct the ancient environment and climate, vital for understanding hominin use of the site. We were very aware that finding more direct evidence of hominin activity – more archaeology – would be necessary for subsequent funding support.

We were very fortunate that Hills

Quarry Products were enthusiastic about allowing our team the time we needed to investigate. The quarry is no longer active for gravel extraction, and because of its position 5m below surface level it is inundated with groundwater. For us to work there, the quarry needed to be fully pumped out, and then the pumps needed to run constantly to prevent it refilling. Keeping the site submerged when we were not working was good for its safety, but it was a major logistical nightmare for doing archaeology. Hills significantly contributed to the project by handling the pumping for both field seasons.

Excavations began in 2019, after which work was put on hold due to the covid-19 pandemic. Analysis of the first season's results produced crucial evidence for everything except archaeology, which meant that any further work at the site would fall outside the remit of Historic England. We had a hunch there was archaeology to be found, however, so we decided to accept the financial risk and try again in 2021.

The excavations

In April 2019 the first phase of fieldwork included a programme of fieldwalking, investigation of the sedimentary sequence through geoarchaeological boreholes, and aerial photogrammetry terrain modelling. In May and June, based on the previous work, we undertook excavations which



Trench with mammoth bones, after all fine-grained sediments have been removed down to the bottom of the palaeochannel

permitted assessment of stratigraphy and remains of pollen, plant macrofossils, molluscs, insects and microvertebrates, and OSL (optically stimulated luminescence) dating.

We cleaned and extended informal trenches excavated by the Hollingworths in 2017, and opened new areas across the base of the quarry to examine the archaeological and palaeontological potential of the palaeochannel. These test pits targeted the area where the handaxe had been found, and an area to the south where the palaeochannel survived to a greater depth, allowing a more complete stratigraphic sequence to be established.



DIGVENTURES (2)



Above: Joshua Hogue (left) is in a grid square where an elephant tibia was found; opposite him, Maggie Eno excavates where the scraper was found; behind, Winchester student Oliver Bell is in the square where environmental samples were taken

Though we found no artefacts in 2019, the investigations did provide crucial information on the way the site was formed, as well as a wide range of faunal remains that brought the ancient landscape to life. A big, open river system and floodplain with grasses and sedges had formed over time, similar to modern eastern European floodplains with large meandering rivers. Though the climate was similar to Cirencester's today, there appear to have been no trees or shrubland – and we recovered bones from bovids (cattle) and mammoths (mostly *Mammuthus trogontherii*, a species inhabiting open grassland habitats across Eurasia before 200,000 years ago). Four OSL dates obtained by Phil Toms of the University of Gloucestershire centre on around 225,000 years ago.

These early results gave us insights

Above: A mammoth tibia emerging from fine-grained sediment which also contained the flint artefacts

into the worlds inhabited by mammoths and hominins alike. But without artefacts, we could not prove any relationship between the two. The lack of archaeology was disappointing, but

our team felt strongly that we needed bigger trenches, and more area to excavate, before we could turn our backs on Cerney Wick. At Stanton Harcourt, Oxfordshire, where well-preserved mammoth remains were excavated in a palaeochannel dating from around 200,000 years ago, archaeologists found just 36 stone tools – including 11 flint handaxes – across an area of approximately 150m by 100m. In 2019 we excavated no more than 13.5m by 4.25m of deposits. We decided to dig again, and connect our trenches across undisturbed sediments.

We adopted a different approach in 2021, linking up the stratigraphy of the existing trenches with a 360° mechanical excavator, and removing quite a lot of the overburden left from quarrying activity to expose a wider area



Right: University of Winchester student Oliver Bell marks stratigraphic boundaries

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of in situ deposits. Newly exposed deposits were targeted by hand and all the sediment 5ml wet-sieved for the recovery of artefacts that we might otherwise have missed. This allowed us to investigate more of the area at the edge of the palaeochannel in comparison to the much smaller targets at the centre of the former waterbody. This was important to the results, because we were looking at lower-energy flow deposits, meaning that whatever we found was more likely to be lying where it had originally fallen, rather than being tumbled in the higher-energy flow in the middle of the river.

Excitingly, this strategy paid off. We recovered beetles in samples from the sands and gravels (studied by Enid Allison of Canterbury Archaeological Trust), suggesting they formed in a climate only slightly cooler than today, and molluscs (snails, studied by Matthew Law of L - P Archaeology) point to an environment of open grassland lacking in trees. We also found additional large mammoth remains laying at what would have been the periphery of the channel. Importantly, in the same location was an assortment of flint tools. These comprised a flake and flake fragment without further modification, and at least three retouched tools – all in relatively fresh condition and unlikely to have been moved far. We had found archaeology. Though small, the flakes are unmistakably intentionally worked lithic artefacts, lying in the immediate vicinity of mammoth bones.

Right: Drone view of site during excavation



Right: University of Winchester student Hayley Tianbei Liu excavates a mammoth tusk



Below: Gravels overlying the paleochannel, sampled for OSL dating and thin-sectioning sediments

The artefacts

The evidence from Cerney Wick that brings us face-to-face with the Neanderthals who lived there consists of eight lithics: the handaxe found in 2017, and seven artefacts found during the 2021 excavations. There are some typical features found on the tools, but also some interesting diversions that have piqued our curiosity.

The handaxe is made from high-quality flint, and is only slightly abraded, notably more so on one face, possibly indicating that it had lain on a surface following discard. Given the lack of raw material of suitable size or quality available locally, we can reasonably assume that it was made from flint from further afield, with the nearest possible sources being about 20km to the south on the Marlborough Downs. An



elongated flake and a flake fragment were also recovered from the site, and have evidence of having been made using the same soft-hammer technique as the handaxe. The artefacts differ from each other in raw material and condition, which might mean they were made during different episodes of activity, though each was found in deposits dating to around 210,000–220,000 years ago, towards the end of Marine Isotope Stage 7.

All the remaining artefacts were made on locally available river gravels, with evidence of having been intentionally modified to form crude tools. Each one has been retouched, with continuous removals along at least one edge, yet none fit clearly within a recognised or standard tool typology. Given the lack of local materials, gravel pieces of suitable size and shape appear to have been selected to make tools. For example, one is made on a heavily abraded and frost-fractured spall that has a large frost-pit scar on one face, forming a convenient thumb-sized impression. It was subsequently retouched at one end to form a scraper-like tool.

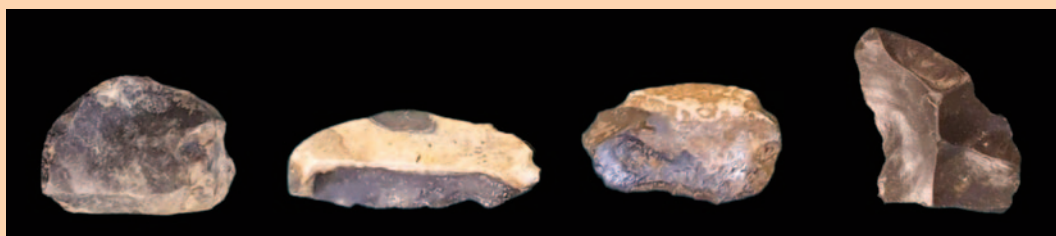
Although the assemblage is small, it is one of only two sites from the region that have a relatively well-understood record of this date, the other being Stanton Harcourt in Oxfordshire. Interestingly, the handaxes found at both these sites indicate the continuation of that technology, in contrast to elsewhere in Britain where there is relatively limited evidence for handaxes beyond the transition to the Early Middle Palaeolithic. As such, this newly emerging evidence may help us to better understand whether handaxes and Levallois technology are responses by the same population to local conditions, or different populations with distinct traditions occupying Britain at the same time.

Most of the evidence collected from our second season of fieldwork is still in analysis, including possible cutmarks on mammoth bones. However, the discovery of flint tools in direct association with vertebrate remains substantially alters the significance of Cerney Wick. The emergence of Neanderthals and their interactions with mammoths is still poorly understood during the transition from the Lower Palaeolithic to the Early Middle Palaeolithic. This is a critical

Right: David Attenborough (sixth from right) with authors Lisa Westcott Wilkins (to his right) and Joshua Hogue (second left), Sally Hollingworth (on Attenborough's left) and the rest of the digging team



Below: The handaxe from Cerney Wick, found on a quarry spoilheap (12cm long)



Above: Flint fragments excavated from the ancient river channel at Cerney Wick at the same location as mammoth remains, identified by the archaeologists as including at least three retouched tools

timeframe in Europe, associated with widespread and persistent use of Levallois technology, often, although not always, accompanied by the disappearance of handaxes. Much of our understanding is based on old, antiquarian collections. New discoveries like Cerney Wick provide an opportunity to reassess existing frameworks for the technological development of Neanderthals.



Right: Frost-damage formed a convenient thumb-sized impression on a flint which was retouched at one end to form a scraper-like tool

Palaeolithic archaeology is like a crime scene: all the evidence matters, and changing even the tiniest of elements can make a huge difference to conclusions. The significance of the tools can really only be seen through the lens of what palaeoenvironmental evidence and advanced dating techniques have contributed to our understanding of the site formation processes, and this fine-grained picture was only possible because of the many scientific specialisms that combined on this project. Bringing archaeologists, palaeontologists, geologists,

geoarchaeologists and so many others so closely together has made a huge difference to the outcome of our research.

Does the Cerney Wick artefact assemblage represent a departure from the Levallois-dominated assemblages considered prototypical of the Early Middle Palaeolithic in Britain? Or is this a product of just what we have found so far? It is a tantalising question, and one that we hope to answer with further investigations.

Lisa Westcott Wilkins is Co-CEO of DigVentures; Joshua T Hogue is DV's site director for Cerney Wick. DV thanks the many specialists who have contributed to the site research. Attenborough & the Mammoth Graveyard was first broadcast on BBC1 in 2021 (see Greg Bailey on broadcasting, Mar/Apr 2022/183) ■