Bojs, Karin. "Doggerland." *My European Family: The FIRST 54,000 years*. London: Bloomsbury Sigma, 2017. 86–93. *Bloomsbury Collections*. Web. 26 Apr. 2023. <<http://dx.doi.org/10.5040/9781472941480.0013>>.

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Doggerland

The dog, the man and the woman from the Bonn-Oberkassel burial site lived at a time of great upheavals. Just a few centuries earlier, parts of Europe had felt the impact of a pulse of warmth that augured the end of the Ice Age.

The harshest period of cold was over. The earth had been slowly thawing out for several millennia. The path of our orbit around the sun had changed, following the repeated cyclical phases known as Milankovitch cycles. More and more solar energy was reaching the earth. Melting snow and ice left dark water and soil exposed, further heightening the earth's capacity to absorb more solar radiation.

In addition to this global warming, temperatures changed dramatically at a regional level. Within just a few hundred years – possibly even faster – the average temperature in north-western Europe rose by several degrees. This was probably due to shifts in Atlantic currents.

It may sound as if the growing mildness of the climate, once so cold, must have been a blessing for Ice Age people. Yet I am not sure they saw it that way to begin with. The change seems to have been so rapid that they had no time to acclimatise. Within a mere generation or so, the hunters of the Ice Age were forced to change a way of life that had served their forebears well for many thousands of years.

In the longer term, the warmer climate brought a great improvement in living conditions. Higher temperatures and more precipitation meant richer vegetation and hence more prey. This enabled more people to survive and reproduce. DNA analyses show that the hunters who peopled Europe multiplied rapidly at the end of the Ice Age. But now they had to learn to hunt the new kinds of prey that thrived in the new forests, or to follow the reindeer on their migrations north and eastward.

Those who followed the reindeer due north from Bonn-Oberkassel would have reached Doggerland, a land mass that no longer exists. Today it lies beneath the North Sea. Sometimes the Dogger Bank is mentioned in weather reports. But Doggerland, now part of the seabed, once extended from Denmark to Scotland. When the land mass was at its largest – about 20,000 years ago, during the coldest period of the Ice Age – it probably stretched as far north as the Shetland Islands. Doggerland was separated from the Norwegian coast by a narrow strip of deep sea, corresponding to what we now know as the ‘Norwegian trench’. Midway between the Shetlands and the area now occupied by the Norwegian city of Bergen were mountains, dubbed the ‘Viking-Bergen Island’ in retrospect.

For certain periods, Doggerland may well have been one of the most favourable habitats anywhere in the Europe of the time: fertile land criss-crossed by freshwater rivers, with ample access to game.

In a display cabinet in the Danish National Museum, Copenhagen, I have seen tools and art objects made of bone and antler that were fashioned many thousands of years ago by people living in Doggerland. Some of them have turned up in fishermen’s nets, while others were found washed up on Danish beaches. Underwater archaeologists have searched for sunken settlements off the coasts.

Back in the nineteenth century, oyster fishermen began to find strange bones from mammoths and reindeer in the waters off the coast of Britain. In 1931 the British trawler *Colinda* dragged up a barbed spearhead made of antler that has been dated at nearly 12,000 years old. Since then, fishermen, divers, archaeologists and geologists have discovered many objects that tell us how prehistoric people lived in the area that is now part of the seabed. But the latest information about the sunken land comes from a different and unexpected source.

I travel to Bradford, England, to interview the archaeologist Vincent Gaffney, the director of a major project that resulted

in – among other things – *Europe's Lost World: The Rediscovery of Doggerland*. This book, published in 2009, is the most extensive overview of the subject to appear so far.

Had I been travelling 10,000 years ago, I could have walked dry-shod all the way from Sweden to Bradford. Instead, I fly to London and take the train to northern England. Despite the great beauty of the green, rolling countryside that surrounds it, the inner city itself strikes me as depressing. The glory days of the textiles industry are long gone. Few visitors come here of their own accord these days. A woman on the train asks me why on earth I want to visit Bradford.

But the University of Bradford clearly has a strong reputation. It turns out that Vincent Gaffney was appointed there after a conflict with the University of Birmingham, his previous employer.

We are meant to be meeting in the morning, but at the last minute Gaffney is called away to a meeting at his new university. Instead, we meet late in the evening in the hotel bar. It is an unusually muddled interview. I confine myself to two small ciders, but Gaffney manages to down three large beers. A red-haired man in his sixties, he is already pretty lively at the start of the evening. As the hours pass and the level of beer in his glass sinks, I find it increasingly difficult to channel his verbal outpourings. However, the flashes of wit and the wild associations he comes out with are underpinned by brilliant, groundbreaking archaeology.

Gaffney began his career as a specialist in Roman remains in the Mediterranean region, but over the years he came to focus on remote analysis – a variety of methods for investigating land at a distance, without the need for excavation. He was running a course on the subject for doctoral students at the University of Birmingham when a student asked which region he most longed to research. 'Doggerland' was the obvious answer, as much of European prehistory is likely to be preserved there, on the seabed. The young doctoral student then proposed they work together, using data from oil companies prospecting for gas and oil. That was an option Gaffney had not previously considered.

They managed to link up with a geologist with expertise in surveying North Sea oil and gas deposits – exactly the relevant field. With his assistance, they were able to access a large quantity of data, which they processed by computer.

The technology they applied, 3-D seismic surveying, normally serves to probe layers much further down in the seabed, where oil deposits can sometimes be found. The archaeologists, however, wanted to conduct a more superficial survey, going down just a few metres. They were delighted that the method proved equally effective for their purposes. Within just 18 months, the research team was able to put together a detailed map of a section of Doggerland the size of the Netherlands. They created an image of a whole landscape, with lakes, wetlands, estuaries, mountains and plains. It was crossed by a large river, which they named the Shotton, after a distinguished geologist.

Unfortunately, there is one question that appears difficult to answer. What did the periphery of Doggerland look like? How far out into the Atlantic did the land mass extend at different times? I repeat my question several times in different ways, but finally Vincent Gaffney says I'll have to accept that they don't really know.

The best maps currently available were drawn up in the late 1990s by the British archaeologist Bryony Coles, from Exeter. Her work was based mainly on modern measurements of the relief of the seabed. At that time, researchers had just established that the sea level had risen about 120 metres (390 feet) since the coldest period of the Ice Age, 20,000 years ago. It was therefore reasonable to assume that all the areas of the seabed lying less than 120 metres (390 feet) down must have been dry land at one time or another. That would imply that areas which are much shallower, such as the Dogger Bank, would have been high mountains. However, the match is not quite that simple. The major rivers that once flowed across Doggerland bore sediment that accumulated over the millennia. The landscape changed both in surface area and relief. Bryony Coles's maps are thus based on reasonable assumptions, rather than on hard facts.

Analyses of pollen from cores sampled from regions bordering on Doggerland reveal how the vegetation changed. The predominant landscape type during the coldest periods of the Ice Age was dry tundra. Unlike the interior of Scandinavia, Doggerland was probably not covered by thick ice sheets. Gaffney believes that small groups of Ice Age hunters visited the region even during the coldest periods of the Ice Age. One indication of this is the flint tip of a weapon, discovered by pure chance in the course of drilling in the seabed off the Viking-Bergen banks.

At the end of the Ice Age, the sea level rose and Doggerland shrank. Yet the remaining areas of dry land became all the more fertile. Woods appeared, with small birches and willows first, gradually giving way to pines and hazel; hardwood broadleaved trees such as elms, lime trees and oaks came later.

Gaffney hopes to secure grants that will enable him to pursue his research. He wants to have drilling carried out on a large scale in those areas of Doggerland that he thinks most likely to have been populated. These are mostly around estuaries and river mouths, along rivers and, above all, around the great 'Silver Pit' lake.

He has already had drilling carried out in one or two places. He has subjected deposits from a settlement identified on the seabed off the Isle of Wight to a new type of DNA analysis. The whole core sample is analysed together at the same time, then researchers use computer-aided analysis to try and identify the organisms of which traces have been found in the sample. This produces detailed information about the diet of the people living in the settlement. Different species of plants and animals can be identified from the DNA sample.

Gaffney is convinced that Doggerland was one of the heartlands of the hunting cultures that peopled north-western Europe after the end of the Ice Age. It afforded them the best hunting and fishing. Present-day England and Scotland, on the other hand, were bare, inaccessible mountainous regions

at that time. They had little to offer. The inhabitants of Doggerland may have migrated there for relatively short periods in order to hunt.

The people of the time probably also regarded the southern part of today's Sweden as temporary hunting grounds. Large tracts of Sweden were still covered by ice 14,000 years ago. The southernmost tip and the west coast of Sweden, however, were ice-free and received occasional visitors. To reach Sweden, all people had to do was cross a few rivers. There were periods when they could travel all the way from Doggerland to the region now called Skåne, which forms the tip of southern Sweden – without crossing any bodies of water.

The very first people to visit Sweden were probably a group of young adventurers living about 14,000 years ago. They belonged to what is known as the Hamburg culture, after the north German city of that name. This was a culture of reindeer hunters who followed the migrations of their quarry over vast areas. Doggerland was one of the heartlands, but the same culture extended from the region that is now Belgium in the west, through Denmark and northern Germany, to Poland in the east.

To travel from Denmark to Sweden, the adventurous young reindeer hunters had to cross a broad and very rapid torrent. It must have been a hazardous undertaking to get across by boat, particularly at the narrowest point, between Helsingør on the Danish side and Helsingborg in Sweden. To the east was the Baltic ice lake, a great lake formed from meltwater from the ice sheet. As it was much higher than the North Sea, water poured out through the Öresund Strait with great force. Presumably it would have been safer for these young people to paddle a little further north and land in the region that is now the Swedish county of Halland.

They may have crossed the ice in winter. But that was also dangerous, as the ice sometimes broke. They would have had to tap it with their spears at very regular intervals to check its thickness and stability.

Yet it may have been worth their while to take up all these challenges, as reindeer and horses thrived on the margins of the great glacier in summer. The same applied to the best fur-bearing animals, wolverines and Arctic foxes. And today's archaeologists believe an expedition to new, unknown land would have conferred honour and prestige. The young adventurers returned to the new land again and again to hunt, but never stayed very long.

Thousands of years later, when the land beyond the Öresund Strait had already been known as 'Sweden' for several centuries, collectors would sometimes stumble across a flint arrowhead left by the first visitors.

For a brief period – 300 years, perhaps – there was probably a land bridge between Denmark and Sweden. By that time the climate had again become somewhat milder. The reindeer-hunting Hamburg culture from the tundra was replaced by the Bromme culture, which was more specialised in hunting deer, elk and other animals suited to life in birch woods. Everything suggests that this was essentially the same group of people; it was just that they adapted their culture somewhat as the climate grew warmer, woodlands emerged and their prey changed. The waters of the Öresund Strait seem to have dried up about 13,000 years ago, after which reindeer, deer, bears, beavers and people streamed over into Sweden. The people of the Bromme culture were active in Skåne for several generations.

Then the Öresund Strait was flooded once again. The Atlantic currents changed course again, and the cold returned. The Ice Age reappeared in north-western Europe, as what geologists call the Younger Dryas. The birch woods disappeared, replaced by tundra, lichen and flora such as mountain avens (*Dryas octopetala*). This period of cold lasted

for over 1,000 years. For most of this time, Sweden was so cold that it would not have been habitable. It was not until the end of the Younger Dryas, when the cold gradually became less severe, that the odd few reindeer hunters from the continent started to return. They probably crossed the Öresund Strait by boat from Denmark.