Prehistoric Cooking Pots

Published 19 February 2024, with Harry Robson.

Six thousand years ago in northern Europe, the first Neolithic farmers were bumping up against Mesolithic people, who made a living hunting and fishing and gathering wild plants. Both groups of people made ceramic cooking vessels for their food, and those pots have now revealed that in many respects the diets of the two cultures were more alike than different. How do they know that?

Harry Robson: Just imagine, you know, on a frying pan in the 21st century. If you've cleaned it, no matter how many times you've cleaned it or used it, if you turn the underside which has had contact with the hob, you'll see dark black patches on there. And even on the inside, if you haven't thoroughly scrubbed it, you'll have this food which is sort of sticking to it, food residues which are sticking to it. And that's essentially what we analyse.

The hunter-gatherer pottery tends to be — not all cases — but it tends to be more crude in terms of how it was constructed and the walls seem to be much thicker, whereas the agricultural pottery tends to be a lot more refined. And I don't mean that in a disparaging way to ... These indigenous hunter gatherers were still extremely skilled.

Jeremy: And how big are the bits you're looking at?

Harry: In some cases, they are about the size of your palm. In some cases, smaller than that. We're talking maybe four or five, six centimetres in diameter. And then in other cases, we have some really nice examples whereby we have sampled from intact vessels, as in whole pots, which have been deposited in waterlogged environments, either on land such as rivers or streams, or in the sea in fjords.

Jeremy: What can you tell about how people were using the pottery?

Harry: What we have done, at least with the group I've been working with for nearly a decade, we've been extracting the lipids,

which are the fats, waxes and resins, and what we've been doing is extracting those and characterising them and identifying them within the pottery itself. So we do this via two means. Either directly analysing food crusts, which again is the term we've given to carbonised organic residues, and we sample those generally with a scalpel. Or if we are working on pottery which doesn't have these food crusts, we will drill directly into the the pottery itself. And via a series of extraction methods will we will extract the lipids and then characterise them using isotopic as well as molecular characterisation techniques. And we'll identify specific biomarkers associated with, say, plants or aquatic resources as well as dairy fats.

Jeremy: So if I've got this right, then different plants, different kinds of plants, different kinds of animals, produce different kinds of lipids. And if you know what the lipids are in some detail, you can kind of work out what kind of animal, what kind of plant produced it is that. Is that right?

Harry: Yeah, that's pretty much pretty much spot on. But the only issue is that it's very difficult to get taxonomic specification.

Jeremy: What do you mean by that?

Harry: It's quite straightforward to say. Oh, yes, you know, plants had been processed, cooked in this vessel. Dairy fats had been processed, stored, cooked in this vessel. But it's difficult to say it was definitely, you know, birch or it was definitely tar, definitely pine. Now, I've actually said two species of trees which you can identify because they do have very particular profiles. However there are others. Oak, it would be difficult to say with any degree of certainty. Same with Hazel. It's the same with, with dairy fats. So you can say, for instance, oh, yes, dairy had been processed in these, but differentiating between, say, cow's milk, goat milk or sheep milk would be extremely difficult using the approaches we apply.

Jeremy: So what exactly were the two groups cooking in their pots?

Harry: So in this case, they were cooking all sorts, in short. So we had hunter-gatherers who in some regions that were cooking aquatic resources in much more frequency than other regions. So for the Lower Rhine basin, which included the Swifterbant cultural group, they were primarily using their pottery in order to process fish. And then when the agriculturalists come in, they seem to have in some

respects continued processing aquatic resources in their pots, but with the addage of the presence of dairy fats. And then in other regions again, it was very similar in the central and the western Baltic, with the hunter gatherers who were part of the Ertebølle culture, they were using the vessels to process aquatic resources, both from coastal as well as inland locations. But they also, intriguingly, had dairy fats in quite a lot of their vessels.

And there are some nuances, you know. There are some cultural groups, particularly of hunter-gatherers, who seem to have a more broad range of resources that were cooked in their vessels, whereas other groups seem to be in some respects specialized in the processing of aquatic resources. And then when the early agriculturalists come in, in general, they seem to — at least in the regions we studied — they seem to continue in some respects from the hunter gatherers in terms of, they use the pots to process aquatic resources, but also they have a higher frequency of pottery use for storing or processing dairy fats. So milk, yogurts, butter, cheese.

Jeremy: So both groups then, the hunter-gatherers and the farmers, were processing foods associated with the other group. The hunter-gatherers were processing dairy and the farmers were processing aquatic products and wild plants.

Harry: In some respects, yes. Although at least the hunter gatherers with the dairy fats, we don't think that they were milking per se. We think they probably had contact with nearby farmers and obtained dairy fats from them. That's our working hypothesis.

Jeremy: And were the the farmers fishing on their own account, or were they getting aquatic products from the hunter gatherers?

Harry: We think they were fishing on their own account. But we think ... You see, what we have is in at least one of the regions we analysed — the western Baltic, which encompasses Denmark, southern Sweden and northern Germany — we have hunter-gatherers living on the landscape, but around I think it's about 1000km away, we have farmers who were again living in northern Germany and northern Poland. But you seem to have this sort of frontier, whereby these incoming farmers are — incoming in terms of they've expanded from the south — they seem to stop and don't penetrate into these hunter-gatherer areas. And so you have this — not coexistence because we think that comes later — but we have

this sort of separation between these two different groups. And we assume — well, there's quite a lot of evidence, actually — that there is interaction between the two. And then subsequently when the early farmers, let's say, fully occupy and or overtake ... I'm not sure how how this process took place, exactly, but when they occupy areas which were once lived in by hunter-gatherers, we think, at least in some of the regions studied, that they probably observed resident hunter-gatherers and learned how to do fishing, shell fishing, marine mammal hunting.

Jeremy: So do you think they were bartering with one another, the two groups of people?

Harry: Oh, it's definitely possible. I mean, there is other evidence, material culture wise, in terms of types of stone axes, unique types of bone rings or shell beads, which were predominantly found ... Well, there are two or three sites in Denmark which have these shell beads, for instance, but they are also found in areas which would have been occupied by farmers. So the question, of course, is who made them? Is it the hunter-gatherers who have made them, or the farmers who have made them? But both there seem to be, you know, in areas occupied by both at the same time. And it's the same with these axes, shoe-last axes they're called — beautiful axes — and they're very characteristic of farming groups. However, they are also found in and on hunter-gatherer sites.

Jeremy: So these, these people, they were eating many of the same foods. Maybe they were bartering. Is there any evidence of interbreeding?

Harry: No evidence whatsoever, at least in the regions we analysed. There are very odd occurrences further south. I think a genetic study was undertaken in the Danube Gorges and I think there were two or three individuals which demonstrated that their predecessors had ... I can't remember how far after ... I don't know the relationship as in whether or not it was their parents or grandparents or what have you, but they must have been some sort of interbreeding between those individuals. But at least the genetic analysis undertaken in our study region has demonstrated no intermingling or interbreeding.

Jeremy: It seems from what you've said, that farmers learned to fish and to forage, but fishers didn't really learn to farm, and they didn't interbreed. So what happened to them?

Harry: That's exactly it. That's the million dollar question. So ultimately, they are replaced. We have this population replacement, which has been demonstrated by genetic analysis. So we know for a fact that at least in certain regions, say the western Baltic, which is my main area of interest, southern Scandinavia, northern Germany, Denmark, as well as southern Sweden, we know for a fact that at around 4000 BC, so around 6000 years ago, we have the hunter-gatherers are 100% replaced by the farmers. Genetically they are. But where did they go? We don't know. We don't know if they were killed off. But there is no evidence that they they were interbreeding. At least, from the genetic sense, they must have either been killed off or died because, for instance. Not necessarily a plague, but new diseases, infections, may have been brought along with the farmers. There is no environmental effect that was so detrimental that would have killed off a load of hunter-gatherers as well. So it really is an interesting question, which we're still trying to, you know, understand. What happened to the hunter gatherers? Yes, they were replaced, but why? And were they completely wiped off the face of the earth? I'm not sure.

Jeremy: So, having looked at all this pottery and shown that both groups of people were eating the same sorts of foods, how do you see the story of farming replacing hunter gathering now?

Harry: They did eat the same sorts of foods, but there were there were slight nuances in terms of these hunter-gatherers did have a more heavy reliance on marine mammal hunting, shell fishing, fishing, etc. That doesn't mean that the Neolithic people didn't have the same sort of focus, because at least in some regions, they did, and did consume similar foodstuffs, maybe not to the same degree, but they did. But they also had domestic animals, which the hunter-gatherers tended not to have.

The big takeaway points, at least from the current study, was the fact that we have such ... Well, we have more evidence for the processing of dairy fats in hunter-gatherer pottery than we previously had, mainly because our group had undertaken quite a few studies in the past, and we had these small little indications that the hunter-gatherers had dairy fats. And we always thought, oh is it possible that they had milked dead deer, which is a reasonable suggestion, a hypothesis. And then, after this current study, when we had so many occurrences of it,

particularly in the western Baltic, we thought it's just clearly not coincidental.

They must have had contact with the farmers in order to have obtained these dairy fats. That was the biggest surprise for me. And. I mean, that pretty much is only in the western Baltic as well, compared to the other regions. In comparison with other regions, other studies which I've been involved in, whereby a range of pottery from Spain, Portugal and France had been analysed as well as other areas of Europe. At these regions, the early farmers' pottery didn't have any evidence for the processing of aquatic resources. Whereas in the four regions we studied in this paper, farmers had used their pottery for processing aquatic resources. And it's not just one or two pots. They must have learnt fishing pretty much as soon as they had arrived on the landscape. So I think that those are the two key points which which I think are pretty pretty unbelievable.

Jeremy: You shouldn't say they're unbelievable. You've got evidence.

Harry: Well, yeah. I mean, yeah, 100% believable. Now if you look at the genetic evidence and you think, right, okay, these people have essentially learnt how to obtained aquatic resources from a water landscape pretty much as soon as they enter these landscapes. And they must have had a degree of skill, and they must have had some interaction and ... Well, I think we made the point that it was potentially indirect or direct observation from hunter-gatherers. So there must have been hunter gatherers and farmers on the landscape at that time after the transition, for at least a century, maybe two, three centuries. And that's pretty unique as well and very interesting given this complete population turnover.