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The Prehistory of Bread

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Editors note: *This publication contains the video of the talk from the Fermentology webinar series, as well as a lightly edited transcript of the lecture.*

Abstract

The origins of bread have long been associated with the development of farming communities that first cultivated and domesticated cereals in the Fertile Crescent 10,000 years ago. However, most recent discoveries show that bread was not a product of farming, but perhaps something which fueled it. Amaia and Lara share the story of the discovery of the oldest bread and what we do and don't know about its recipe, how it was baked, and more. They will also talk about the cereal-based foodstuffs that prehistoric communities consumed in Southwest Asia and how they changed with the development of new technologies such as pottery.

[Amaia Arranz Otaegui](#) is Assistant Professor at the University of Copenhagen. She is an archaeobotanist and investigates the use and consumption of plants by prehistoric hunter-gatherers and early farming communities in Southwest Asia. Lara [Gonzalez Carretero](#) is an archaeobotanist at the Museum of London Archaeology (MOLA) and a researcher at the Scientific Department of the British Museum. She is an expert on the study of archaeological food remains, with especial interest in cereal meals such as bread, porridge, etc.

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The Prehistory of Bread | Fermentology mini-seminars

Introduction

This talk will cover the prehistory of bread, what we know about the origins of bread, and what we don't know, which is quite a lot, actually. We will provide an overview of the evidence we have so far.

What is bread and how we can define that? Bread is a rather cultural term, that makes reference to different types of foods, actually, because if I think of bread, in Spain we eat a lot of French baguette, but somebody in Syria or in Jordan would be eating a flat bread. And perhaps somebody from Ethiopia would be eating bread that looks more like a crepe almost, called injera. All these are bread remains, so all these are bread. But they're very different in terms of ingredients and cooking methods.

So, how do we define bread? If we go to the dictionary, bread is defined as a food which is made from flour. And here, we need to be careful, because flour can be obtained from multiple types of plants, not only cereals.

We can make flour with other types of plants too.

Then a liquid is added. So in this case, water but it could also include milk, for example. It usually has yeast, but this is not necessary always. These ingredients are mixed together to form a dough that can be baked, and here I would add that bread can also be fried or steamed, for example. So, it's very important to think about bread in with an open mind, in the sense that, especially when we talk about prehistoric bread, these type of foods could have been very different from what we eat nowadays and what we call bread.

So that being said, what are the origins of bread? The origins have traditionally associated with the Neolithic period. This is because the bread we eat nowadays, especially in Europe and in the United States, is made from cereals. And cereals were first domesticated during the Neolithic period.

So to understand this process, we actually have to make a journey to Southwest Asia, which is the region of the world that comprises modern day countries like Syria, Jordan, Israel, Palestine, Iran, Iraq, Turkey and so forth. This is the region where the wild ancestors of modern domesticated species grew spontaneously. People for thousands of years were exploiting these cereals, these wild species.

The origins of bread are linked to the development of agriculture. This was a very long process of development. During the Neolithic period, the story was that people first started to cultivate wild cereal species more or less around 11,600 years ago. Then, within 1,000 years, people started to exploit both wild and domesticated cereals, so it was a mix of species. Then around 10,000 years ago is when we start to talk about agriculture.

So we are here talking about societies that rely on the exploitation of domesticated species. And it was in this context that the earliest evidence for bread making was found. The story was that as people first start to cultivate and domesticate, agriculture emerges, and then as a result of that, people start to consume bread, beer, porridges, and things like that.

Some scholars have suggested that people could have been making bread before the Neolithic period. That was suggested for the Paleolithic hunter-gatherers, and especially for the [Natufian culture](#), who were very special hunter-gatherers. They inhabited Southwest Asia around 15,000 to 11,600 years ago, and they are really cool.

These hunter-gatherers are the first communities that start to settle down and build stone houses. Then, they started to intensively use waters and aquariums to process plant and animal remains. Then, they produce all this really beautiful artistic and symbolic manifestations and decorations. So we have decorated skulls, we have jewelry, we have very elaborate burials with associations with animals, and so forth. They also produce sickle blades, specialized tools for harvesting plants, and these sickle blades have been associated with the harvesting of cereals.

Shubayqa 1, located in the northeastern part of modern Jordan, is a wonderful and well-preserved Natufian site. The excavation of this site was directed by Tobias Richter at the University of Copenhagen.

At the site there is a main structure made with lovely basaltic stones, with a huge fireplace in the middle. The excavation of the site focused on this fireplace, the reason being that people were living in this hut and they were using this fireplace. The residents used lots of plants and animal remains, and then they left the hut.

As a result, this fireplace was left in situ for archaeological study. Sometime after the fireplace was initially abandoned, people came back and built a new fireplace in almost the same location with similar characteristics. In these fireplaces, thousands and thousands of plant and animal remains and even some tools were found.

Within the plant assemblages in the fireplace a huge amount of tubers were found. Tubers are the underground part of the plant, so it's like a root which is thickened. This is a wetland plant that grows close to the lakes and so forth, and is edible. It's very interesting plant we will talk about later.

Numerous other plants were also found, including mallow, poppy, saltbush, and some wild cereal grains like barley, acorn, and oat. These are all wild species. In addition, some strange, amorphous remains were found; they were ugly and quite small (less than one centimeter). They are called amorphous remains of plant tissues, or objects. Traditionally, no one had been paying much attention to these type of remains.

This has to do with our discipline, archaeobotany. Archaeobotany studies the interaction of humans and the environment and how people were using plants and so forth in the past through the analysis of plant remains from archaeological sites. And there are many types of plant remains that we can find in archeological sites; those that we can see with our naked eye that are quite big primarily include seeds, chaff with charcoal, fruits and nuts, tubers, and things like that.

People have been digging and trying to recover these types of plant remains, and analyzing them, and so forth. But, the study of this amorphous remains has been something that has started to develop in the last five to ten years. So, it's extraordinary to think that apart from seeds, fruits, and nuts, we are actually finding food remains, processed or prepared plant foods in our sites. That's quite new, and it's very interesting, because it's providing us with evidence, not only of the plant species, that were used for this food, but also the cooking processes and final products, and that's very, very interesting.

In order to analyze these amorphous food remains found in Shubayqa 1, a collaboration was formed between the two authors of this paper, with Amaia having excavated the remains and Lara a PhD student at the time conducting a study on the food remains from archaeological sites. The result was a paper that was published a couple of years ago, showing that the origins of bread could be found at least 14,000 years ago.

This paper was relevant, first because it showed us that food remains are preserved in very, very old sites, hunter-gatherer sites, and they can provide us very important information, and also because we're able to

reconstruct some of the sequence of the activities that led people to actually make it in Shubayqa. So, through the study of this food remains, especially focusing on the plant particles, the plant tissues that are embedded in this amorphous remains, we identified ingredients like wild cereals, especially wheat, and barley, and then oat could have been also used, and then have this club rice tubers that I mentioned before.

These were present also in the amorphous remains. Then, in terms of the microstructure, these amorphous remains resemble flat breads. This is considering factors like the micropores, the quantity, the number of pores, their size, and so forth. So, this is telling us that these people were harvesting all these ingredients.

So, our bread that contained several types of plants. The people in Shubayqa harvested all these wild cereals. They then processed them, and it is very difficult to process them a wild cereals. They cleaned up the tubers, they peeled them, they pounded them, they made flour, and then they mixed this flour with water to produce a dough. We don't really know how this dough, this flatbread, could have been cooked or baked, but when we were conducting some experiments a couple of years ago we tried two systems of two ways.

In one method, we buried the flat breads of the dough under the ashes of the hot ashes, basically, in the fireplace, and we also tried heating a basalt stone, which works very well. It gets very high temperatures, and it's very easy to cook dough, or even fry an egg in such a hot stove. So this could be one of the ways people were cooking on those stoves in the past.

This evidence was showing us, for the first time, that bread was not a product of the Neolithic period. It was invented by hunter-gatherers. And I believe that this is not the oldest evidence of bread. I think we will find older evidence for bread making 18,000 to 20,000 or however many years ago. The important thing here is to highlight that they were hunter-gatherers producing this. And what we don't really know, is whether this food was something that they were cooking on a daily basis, or if it was something special.

So nowadays, bread is consumed on a daily basis. I eat bread every day, and there are several countries where bread is a staple. But we don't really know what it was like in the past. Now we are trying to determine what happened during this crucial 4,000 years from the last hunting and gathering communities to the first farming communities, and then understand the domestication process in these early agricultural villages to try to see what they were eating, if they were eating bread, if they were eating bread on a daily basis, etc.

There is a gap that we have to fill, because the next evidence for bread, is 8,000-9,100 years, and that's a bread that was found in a very, very famous Neolithic site called [Catalhoyuk](#), which Lara has studied extensively, and she will tell us how the story continues, what do we know about bread after these early phases of use and production.

So, as Amaia was saying, the story continues in the Neolithic. It is important to look at the gap between the hunter-gatherers and the Neolithic period. However, I'm going to show you how, by the Neolithic in the near

East, or Southwest Asia, the bread culture and the preparation of bread, and daily eating of bread was actually established, and bread was a staple food for these people.

What we see is that it is actually very important to talk about bread during the preparatory Neolithic, because what we see during that period is the establishment of societies that are producers of food, so these people are actually investing in the domestication of crops. Obviously, cereals, and also pulses and legumes, animals, such as sheep and goat, and these people are actually gathering in larger groups, larger than during the Notufian and the Paleolithic, and they are establishing big villages, and what we will call the early village life. Some of these villages actually, are as big as 10 or 11 hectares, as at Catalhoyuk. One of the most important sites in this area of the world, Catalhoyuk shows these people were using stone vessels, and they moved from mortars and pestles to grinding slabs, or grinding stones, which are more suited to cereal preparation.

They also moved from having a communal, or more social way of food consumption, into a more private one within the household. So, these people will cook around the fire, but we also see the introduction of the oven as a cooking appliance during the Neolithic, which will make bread baking a lot easier, and a lot faster. And later, we also see the diversification of these foods, and these cereal products with the addition of poultry to the cooking technology as well.

It was established some years ago that there are two contrasting culinary traditions around the world, from Southwest Asia to East Asia, really. So, we do have the area of research that we are talking about today. We have it in the center of a grinding and roasting, and baking culinary tradition in which people were actually focusing on grinding cereals into flour and baking bread. So, this area is located in Near East and North of Africa. And this is in contrast with the South and East Asian, steaming-boiling tradition, which was focused on rice and millet being boiled and steamed in cooking vessels, which were actually much earlier than any domesticated crops in the area.

So we do see these two contrasting culinary traditions, and we do see the appearance of ovens in Southwest Asia around 8,000 BCE roughly with pit ovens. Then we will see how bread making ovens like tannour appear sometime around 7,000 BCE. When I started my research, the idea was to try to attest if these communities in the Neolithic, not only from the archeological record as I just showed, and these contrasting Neolithic traditions, but also from the actual evidence of direct consumption of bread, if we could actually attest that these people were part of a bread culture, and that they were actually eating bread on a daily basis.

This research focused on a very well known site. It's a UNESCO site, which has been excavated for more than 30 years. It's the site of Catalhoyuk, and is located in Central Anatolia. This site had continuous occupation of longer than 1,000 years, and it has amazing preservation. We can see how houses were basically abandoned and burnt, and left everything behind. We can even study daily activities, such as not only cooking, but anything that you can imagine. We know everything about these people.

Some of the buildings are very well preserved as well, and there is a dirty area, and a clean area, archeological speaking. The dirty area is the one that gives us information about bread baking, cooking traditions, and cooking technology. And then we do have the clean area, which is the series of platforms under which people were burying the dead.

When I first started working at the site, there had been some very valuable studies by Christine Hastorf and Sonya Atalay back in 2005, trying to tackle down, and trying to track some type of culinary tradition, and food production at Catalhoyuk. However, they thought that bread was only a minor component of the diet, and actually, when I joined the project, we realized that this type of amorphous remains, which were called bread remains or food remains, were actually everywhere in every sample that we were excavating. And so, I decided to focus my PhD research on this type of remains.

After a lot of experimentation, and a lot of different types of analyses which focus on studying the remains under a scanning electron microscope, I was able to create a coherent methodology for the analysis of archeological food, and mainly bread, and I was able to identify four different types of products in Catalhoyuk and these are not only bread, but also a type of bread dough. A flatbread bread, a porridge-like material, and a naturally leavened bread.

Obviously, flatbread was the most commonly recovered from the archeological record, and some of the ingredients that we found that they were made of were cereals, almost 90%, as you would expect from bread.

And then we also have the first known evidence of condiments being added to this flatbread. In this case, they were adding wild mustard seeds. We also see that this bread was not only made of cereal, but also there is a continuation of the use of the tubers, that I mentioned for Shubayqa 1. We also have them in these breads from Catalhoyuk.

In one sample you can see some of the microstructure of the root. But also, as I said, we do have the first leavened breads, and these breads, when I say naturally leavened, I don't mean a sourdough. I know many, many talks from this series have focused on the sourdough, but what I actually mean, is that we believe that people in this community were making a bread dough. They will leave this dough in the open air to gather some of the wild yeast that is floating in the environment. Then, after three or four hours, they will bake this bread.

The consistency and microstructure of this bread was a lot more porous, a lot more flexible. This is a microstructure, a type of bread that differs from the flatbread in which, like as I said, is very porous. And the pores are really, really small. So they really compare very well with experimentally prepared leavened breads.

So, I was able to conclude that at Catalhoyuk there is a high reliance on bread products, they ate these products, this bread every day. And they do have a well established bread culture from the 7,100 BCE with the later diversification of products coming in with porridge, and porridge-like materials, around 6,500 BCE. So, in

the very early levels, we do have a lot of flat bread, and dough, and naturally leavened bread, and then we do see the porridge coming in around the Middle Neolithic. We do see how porridge kind of takes over during the late Neolithic period.

This is really surprising because everybody always thought that bread was a late thing, that bread was something that would come in later on, instead of porridge coming later on. Because it's easier to make porridge. You just mix it with milk, or with water, and that's it.

Bread actually takes a lot of effort, in principle. This also is contrasting with what we see from the Bronze Age. From the Bronze Age on, we do see a diversification of bread products with bread being central to civilizations, such as in Europe, or Egypt. And we do see more than 300 types of bread being written down on the tablets in Uruk, and also in Egypt.

These Egyptians are the ones that first added yeast, and made beer. So, we do see how perhaps in the Neolithic, there is small diversification of bread-like products with porridge as well, but then this will really, really start and take off during the Bronze Age.

We just wanted to say as well, that the future direction of this work, as Amaia said, we should be investigating the gap between the first hunter-gatherers and the Neolithic traditions. We do need to start working on hunter-gatherers and early farming, and that's what my research is focused on at the moment.

I, personally, am trying to develop the bread culture, focusing my research on the Britain at the moment, and the contrasting bread culture of Europe, continental Europe, with a porridge and beer-based culture in Britain at that time. We also need to start looking more systematically to the study of amorphous food remains that we can recover from archeological sites, so that we can really have a big picture of what people were cooking, and how they were mixing plant remains, also with animal remains.