The Origin of Cooking: Serving up Bright Ideas

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Introduction: In 1977, anthropologist Richard Wrangham proposed that our early ancestors, specifically *Homo Erectus,* would have had to have eaten cooked food to begin the evolutionary process of becoming modern humans. Using a vast amount of data including dental records, stomach size and the decrease in sexual dimorphism of our early ancestors, Wranghram has been able to paint a picture of the necessity of cooking. However, Wrangham's hypothesis suffers from a paucity of evidence for controlled fire within the archeological record. Currently, unequivocal evidence of early cooking occurs almost 780,000 years ago at Gesher Benot Ya'aqov, Israel. At this site, archaeologists recovered fish bones that had been exposed to temperatures under 500° Fahrenheit. But even this ancient site is still shy of the nearly 2-million-year-old *Homo Erectus.* So how did our earliest ancestors cook? For this project I looked over the Gesher Benot. At this site there are many thin anvil stones that struck me as being markedly similar to modern rock grills. As such I was inspired to test the idea of rock grilling to see, first, if such a method of cooking was possible, and second, how it could appear in the archeological record.

Figure 1) Digital Reconstruction of a *Pan troglodytes* skull

Figure 2) *Homo Erectus* skull

Figure 3) Digital reconstruction of *Homo Sapien* Skull

Methodology: To begin with, I wanted to find a rock that was similar to something that could be seen at the Gesher Benot Ya'aqov site. The rock pictured in Figure 4) was one of many thin anvils, which were igneous and, more importantly, manuports. The idea that these were items that could have been multi-functional is particularly exciting to me in this context. These are items that have evidence of being transported, so it makes sense that they would have had to serve as many purposes as possible to be worth that effort. The plan was to cook a series of items on the rocks, measuring the time it takes to cook them to a safe FDA recommended temperature. Additionally, I measured the temperature of the rock over the course of the cooking time using an infrared thermometer. Additionally, as the cooking process occurred, I took note of all materials used, what could survive in the archeological record, and what damages might happen that we could note for future analysis in the search for the origin of cooking. To this effect, I also acquired a recreation of an early stone cleaver from the SUNY Potsdam Anthropology Department. I was unsure if this item would be needed but wanted to have it for basic food preparation, and to see if that would leave any significant wear on the rock or the cleaver .

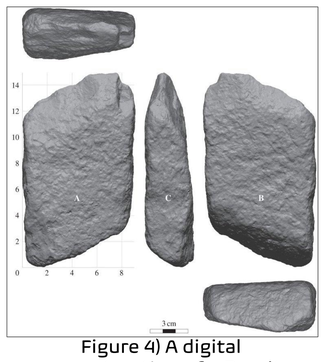

Figure 4) A digital reconstruction of a Basalt "anvil" from the Gesher Benot Ya'aqov site

Figure 5) The granitoid that I used over the course of our experiment

Results: At a base level this experiment proved that it is possible, and relatively efficient, to cook using a rock grill. We managed to successfully cook bacon, eggs, and a chicken drumstick to FDA approved temperatures. Over the course of this cooking process the stone reached 465 degrees Fahrenheit over a 2-hour period and was above 420-plus degrees Fahrenheit for around half of the time. This information is presented more precisely in Table 1). Excitingly, after approximately an hour had passed, when the rock would have first been reaching 400-plus degrees Fahrenheit, a crack formed. This was not a dramatic event, and in fact the reason it does not have a more precise measurement of temperature is because the crack was not noticed until after it formed. A measurement was taken of the crack, and it measures approximately 6-8in. in length which is pictured in Figure 6). This is particularly exciting due to the presence of a slight crack on the digital reconstruction of the Gesher Benot Ya'aqov anvil that bears a similar appearance to the crack on my grilling rock. While this is no smoking gun, I believe it does open up an intriguing possibility of what to look for, as a crack like this could remain in the archeological record.

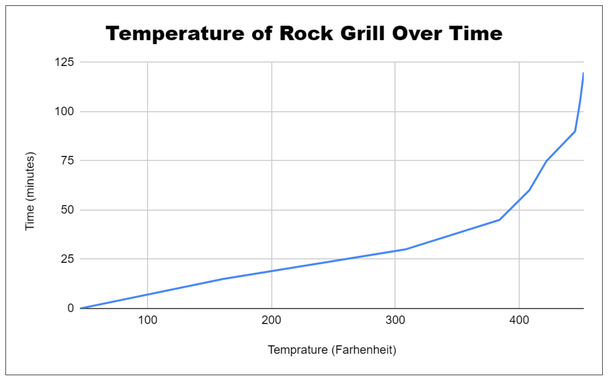

Table 1) A graph of the stone's heat over the course of a two hour period.

Results Cont.: The other items that could survive in the archeological record from this method of cooking would be the cleaver, the bones and the ash. While all of these could reasonably be introduced for a separate reason to cooking, cooking itself cannot occur without them. While the cleaver didn't suffer significant damage to itself or inflict significant damage to the stone it would have been necessary to reduce the meat to a cookable size. As for the ash and bone, while fire could be used simply for warmth and bone could appear from butchery without cooking, both of these are an inevitable component of cooking. Unfortunately, that is the limit of items that could survive in the record as part of this particular cooking process due to the simple nature of what is required. The limited amount of survivable material is also contributed to by the fact that the end product of this process is consumed.

Figure 6) The crack that appeared in the rock, underlined in red for clarity

Figure 7) One of the drumsticks part way through cooking

Conclusion and Continuation: As previously mentioned, this project is a success on a basic level. It has provided evidence for a new possibility to consider in the hunt for evidence of early human cooking. Importantly, I think it has also armed us with the tools to ask more questions. While I was not in a position over the course of this experiment to expand the scale of this experiment, I believe that rerunning this test with a significantly increased number of grilling rocks would allow us to effectively determine when and where heat can cause damage in a rock. Additionally, an increased scale of experimentation would allow us to determine if there are any patterns that appear as a result of heat damage. While there is a non-insignificant number of fire damaged rocks listed in the archeological record I am a firm believer that by practically undergoing this process ourselves it will expand our understanding of what to look for Further research should also include cooking on the rock anvil until it fractures completely. This is primarily because such a process would allow us to potentially identify early human failures, which could aid in lending credence to this idea.

I think it is also worth taking into account that the simplicity of this process lends credence to the concept that our early ancestors may have cooked in a similar way as was conducted during this experiment. The hardest part was maintaining the fire, and the longest cook time wasn't a great deal over 30 minutes. Lastly, the cleaver, pictured in Figure 8), would have been absolutely necessary to reduce any corpse to a manageable level for cooking. During our experiment, the cleaver was unnecessary only due to the pre-butchered nature of the meat that we were working with. Being a tool associated with food processing, we may speculate that cleaver-like tools might be found near cooking sites of this nature in the field.

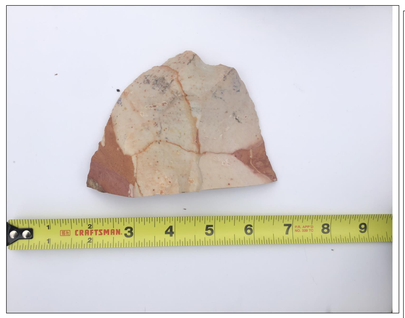

Figure 8) The Replica Chert cleaver used during this experiment

Figure 9) The setup for the rock grill used for this process.

Sources:

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