

Fulacht Fíadh and the Brewing Conundrum, A critical review
evaluating the function of *fulachta fiadh* and the brewing of
beer

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Abstract

The objective of this project was to reconstruct a replica *fulachta fiadh* to reinterpret and assess its possible function. The initial idea for this came from the work of Bill Quinn and Declan Moore in 2007 who re-evaluated the function of the *fulachta fiadh* by successfully brewing an alcoholic beverage and trying to suggest that these were potentially used as

brewing sites. At the time Billy and Declan were getting praise and criticism about this theory. This was a great opportunity to keep the debate about the function of *fulacht fiadh* alive so I decided to do my final year thesis to recreate the experiment and to try to keep it as authentic to what the Irish Bronze Age person had. The idea to keep it traditional as possible and not to use any modern techniques, to use locally sourced materials, construction methods, plants that would have been sourced seasonally and to extract yeast naturally from the air or from the skin of the fruit or plants used in the beer. Unlike Billy and Declan who used brewer's yeast in some of their experiments. There has been a presence of alcoholic beverages/ beer in Ireland as early as the Neolithic right up to the present. Some of the earliest examples come from Scotland. According to Max Nelson (2005, 12) the Balfarg site contained fragments of grooved ware. The residue from the pottery suggested that a variety of cereals, pollen, meadowsweet and henbane contained in the pots, which can be all used for flavourings and for fermentation, some are still used in breweries today. There is also evidence of this through the presence of beaker pottery, but the question that has never been answered is where and how did the Bronze Age people brew beer from a cereal based alcoholic beverage. The *fulacht fiadh* are an enigmatic monument, which has no obvious function. The ideal of mashing cracked malted barley in the trough of the *fulacht fiadh* has proven an effective way of mashing large quantities of wort to convert to an alcoholic beverage.

The initial experiment consisted of malting whole barley, by encouraging germination and heat treatment to stop the acrospire from growing further. Cereal processing with a rotary quern was attempted, which lead to the mashing of the cracked grain in the trough, which produced sweet wort. For flavourings and fermentation, organic apples, strawberries, blackberries bog myrtle and heather were used due to the time of the year there were no other natural yeast bearing plants available. Originally gas chromatography was used to evaluate the percentage of alcohol-achieved from the experiment. But for the proposes of this project and not having access to a gas chromatogpher a hydrometer was used to read the gravity, essentially it reads the volume of sugar in the liquid. The hydrometer would be used to read the gravity throughout the fermentation process nearing the end there would be less sugar meaning the yeast has consumed it and convert it into alcohol. The reading at the beginning and at the end will give a close approximation of the alcohol percentage.

During the Bronze Age, the production or brewing of alcohol was clearly achievable; also, the trough of a *fulachta fiadh* has also proven that large quantities of beer could be created, to facilitate a society or community.

Introduction

Fulacht Fiadh/ Burnt mounds are horseshoe shaped man made mounds, which primarily consist of charcoal rich soil and tightly compacted heat-shattered stone accumulated around a trough. *Fulacht Fiadh/* burnt mounds are generally located in low laying

ground associated with a water source. According to Buckley (1990, 9) *fulacht fiadh* are the most common prehistoric site type in Ireland outnumbering all other prehistoric sites. There are 5000 examples of *fulacht fiadh* in the country and 2500 alone in county Cork. The *Fulacht Fiadh* has a long tradition, dating from the Early Bronze Age right up to sixteenth century AD (Buckley, 1990 9-19; Brindley 1989, 32). Although the exact function of *fulacht fiadh* is unknown it is widely accepted that water was heated or brought to a boil by a means of immersing hot stones from a nearby fire (Brindley et al 1989, 25). *Fulacht Fiadh* even to this day are enigmatic monuments. There are no artefacts characteristically associated with *fulacht fiadh*; this has given little insight to the actual function of the monument. Accordingly, there are various different theories related to the *fulacht fiadh* such as Textile processing, Saunas/Bath, Clothes-dyeing, Leatherwork and Brewing.

This experiment might not necessarily prove that brewing was a definitive activity which took place at these site. But it does show if a community was determined and had enough knowledge the production of alcohol in a large scale capacity was achievable in Bronze Age Ireland. Prior to the use of a *fulacht fiadh* where and how was brewing achieved. It was more than likely done on a smaller scale due to less resources needed, more control having more ability to experiment and refine techniques, organise recipes prior to going large scale. A good example which might explain the smaller scale experimentation or means of heating a liquid are what is

known as potboilers. Potboilers according to Thomas (2010,357) are pots which date to the middle to late Bronze Age that have survived in situ containing burnt shattered stones. Thomas (2010,357) suggests that the deposited stones were used as a means of heating water or other liquids in pottery which could not itself have withstood direct heat from a hearth. Now this is not proof but gives an alternative to practicing a technique before using a fulacht fiadh which uses abundant resources and time.

Discussion

The word fulacht fiadh where did it come from?

In the early Irish history there was very little written down. History, stories, mythology, pottery, songs were all passed down through an oral tradition. It was not until the 9th century AD where we find the earliest surviving texts. These texts are written in old Irish and come in various forms. Within these texts we first come across the word "fulacht". The words *fulacht fiadh* or *fulachta fiadh* (plural) which is used in Ireland to describe mounds of burnt stone has only been in use since the 19th century. The term is based on early Irish literary references from the 9th century AD where the word *fulacht* appears on its own with a variety of spellings and meanings. These are listed by O'Driscoll who has found fifty-nine passages in the early Irish literature where the term fulacht appears '*fulucht, fulocht, folucht. Inadh fulachta (cooking place) occurs, as do fulucht, fianachta, fulacht fianae, folach fiann, fulacht fian and fulachta na bhFian*' (1990, 158)

The term can have a variety of meanings such as 'cooking place of deer', 'cooking place of game' or 'cooking-place of the wild' (O' Kelly 1954). In *Cormac's Glossery* one of the earliest of the literacy sources the name takes the form *fulacht fianxae* or 'cooking place of the roving huntsman'. In later sources such as Geoffrey Keating's history *Foras Feasa ar Eirinn* written between 1633 and 1637. This manuscript is important because its the first time we get alot of detail about how a fulacht fiadh opperated and functioned. Keating tells the story of mythological figure and ledgend Fionn Mac Cumhail and his fianna. Fianna meaning warrior or hunter when translated to English. In this story the Fianna use a fulacht fiadh to heat water to cook a dear and to have a bath.

"However from Bealltaine untill Samhain, the Fian (fianna) were obliged to depend soley on the products of their hunting and of the chase as maintenance and wages from the Kings of Ireland; thus, they were to have the flesh for food, and the skins of the wild animals as pay. But they took only one meal in the day and night, and that was in the afternoon. It was their custom to send their attendants about noon with whatever they had killed in the morning's hunt to an appointed hill, having wood and moorland in the neighbourhood, and to kindle raging fires thereon and put into them a large number of emery stones; and to dig two pits in the yellow clay of the moorland, and put some of the meat on spits to roast before the fire; and to bind another portion of it with surgans in dry bundles and set it to boil in the larger of the two pits and keep

plying them with stones that were in the fire, making them seethe often until they were cooked. These fires were so large that their sites are today in Ireland burnt to blackness and these are now called fulacht fiadh. As to the Fian when they assembled on the hill on which was the fire, each of them stripped off, and tied his shirt round his waist, and they ranged themselves round the second pit we have mentioned above, bathing their hair and washing their limbs and removing their sweat, and then exercising their joints and muscle, thus ridding themselves of their fatigue; and after this they took their meal; and when they had taken their meal, they proceeded to build their hunting tents and so prepare themselves for sleep”.

This is a direct reference from Geoffery Keatings 17th century manuscript describing the use and two possible functions of the fulacht fiadh.

The Function of Fulachta Fiadh.

Fulachta fiadh have been the subject of interest and academic study in Ireland since the mid-19th century. However it was not until the 1950's that this monument type was studied at a scientific level. M.J O'Kelly in 1954 combined the results of his excavations with a review of the evidence from the early Irish literature and a program of experimentation. O'Kelly excavated two burnt mounds at Ballyvourney in Co. Cork. His experimentation demonstrated how these monuments could have been used as cooking places. Using a reconstructed trough filled with water he showed that stones heated in a fire and placed in the trough would bring the water to the boil in 30

to 35 minutes. This water could be maintained simmering at boiling point by adding the occasional hot stone to the trough. In this experiment a 4.5kg leg of mutton wrapped in straw was '*cooked through to the bone and free of all contaminants*' in three hours and forty minutes O' Kelly (1954, 122). In more recent years similar experiments have been undertaken by Christy Lawless in Co. Mayo (1990). Despite the fact that it has been demonstrated that *fulachta fiadh* could be used for cooking there is no agreement in the literature that they were always used in this way. Although Keating's description of burnt mounds in his account of the Fianna appears to suggest they were cooking sites, we need to have caution in how this account is interpreted. Citing other literary references from the late 16th and early 17th century suggests that *fulacht fiadh* should not be considered simply as cooking sites but temporary camps where a range of activities, of which cooking is only one element, were carried out. Antiquarians in the 1800s used Keating's manuscript as a definitive solution to explain the function of *fulacht fiadh* as a cooking site. M.J.O'Kelly based his studies and experiment on Keating's manuscript. Even though animal bone is very rarely present on these sites. A lot of sites where bone has not been present the soil was tested which proved that bone should have been preserved highlighting the idea that they were not used as cooking sites. Since M.J.O'Kelly archaeologists have taken this idea as a given for a function. It has only been recently that the cooking idea was challenged and different theories and functions have been suggested.

General problems associated the value of Irish literary sources have been discussed by O' Drisceoil (1990 157-164). References to *fulachta fiadh* are found in an assortment of texts from early Irish law tracts, glossaries and hagiographies to histories, poetry and annals and span a very large time frame from 9th to the 18th century. This presents a huge time gap between their use in the Bronze Age and references to their use in medieval texts. Written in old, middle, early modern and modern Irish the language of these texts is very difficult to interpret and translate. In addition many accounts are fanciful and would have had a long life in oral tradition before being written down, affecting their reliability as sources for interpreting the function of *fulachta fiadh*. As O Drisceoil has noted these sources have limited archaeological value '*It would be wrong to uncritically accept the early Irish literary evidence in an interpretation of the cultural, social and economic contexts of fulachta fiadh, in dating them and in ascribing a function to them*' (1990, 157) An alternative interpretation to cooking, burnt mounds may have been used as saunas/sweat houses or for bathing (Barfield and Hodder 1987, O' Drisceoil 1988, Barfield 1991). The proximity of these sites to a source of water as well as the many ethnographic parallels for sweat bathing are cited in support of this hypothesis. If these sites were used as saunas the trough which is a feature of many excavated sites could have been used to collect water for steam production or used as a source of cold water for pouring over the body.

Beyond cooking and bathing the possibility that *fulachta fiadh* may have functioned as laundries and centres of textile production where clothes were prepared, fulled, washed and or dyed has suggested (Jeffery 1991). Fulling is the process of cleaning, shrinking and thickening clothes. It has been argued that the debate about the function of *fulachta fiadh* should take into account the general range of uses to which hot stones can be put. Barfield lists the following suggested uses for hot stone technology - storage heating, beer making, canoe manufacture, drying meat or fish, fumigation to eliminate flies, butter production, pottery firing, leather preparation, metal working, fulling, steam for birthing, the extraction of grease from animal bones, salt production and the use of steam to bend long timbers for use in building (Barfield 1991, 62-64). *Fulachta fiadh* should perhaps not be thought of simply as cooking sites but rather multi-functional features of temporary settlements used for both cooking and washing. While this discussion has focused on the possible domestic uses of *fulachta fiadh* the possibility that some of these sites may have had a role within the large scale production of alcohol in Bronze Age communities should also be considered. While the position of *fulachta fiadh* in the wider settlement patterns of the Bronze Age is not very well understood, associations between these sites and other contemporary monument types has been noted across a number of regions. In the south Limerick region, survey has shown that *fulachta fiadh* are one component of an extensive range of Middle Bronze Age sites,

including burial and domestic sites forming an integrated settlement pattern (Cooney and Grogan 1994, 124). Similarly Waddell (1998, 117) points out that a number of *fulachta fiadh*, near Carron, Co. Clare, seem to be part of a complex of sites including field system, cairns and wedge tombs (Hayden 1994). In the Monavullagh Mountains, Co. Waterford a group of *fulachta fiadh* have been found in close association with house sites, stone circles and multiple cist cairns (Buckley 1991, 7). In Mooghaun, Co. Clare an association between the distribution of *fulachta fiadh* and standing stones has been identified (Grogan 1996). Perhaps a greater understanding of these ubiquitous monuments will emerge from more intensive regional landscape studies which place more emphasis on integrating these sites into the broader settlement patterns of Bronze Age Ireland. With so many previously unknown *fulachta fiadh* being discovered every year across the country this presents a challenge for Irish archaeology.

As previously stated *fulacht fiadh* are made up of burnt shattered stone generally some combination of sand stone and granite mainly underneath this mound there are various different features such as a trough that has many different construction methods, split planked wood, stone lined, wicker brush wood and round wood construction. Other features are some form of pits or storage pits when considering the lack of or presence of any artefacts never mind characteristic artefacts from a *fulacht fiadh* site are very sterile. The reason been poor preservation of the particular artefact type, any

object or artefact was removed after fulacht fiadh was used or more than likely poor excavation skills due to the mound material been extremely difficult dig into at times. in fact to find an artefact is a very rare occurrence. I personally have excavated 20 puls of these sites and only one of them had an artefact which was a fragment of a Quern stone. There is no diagnostic artefact that can be identified as an fulacht fiadh artefact. The artefacts that are found also give us very little insight to what the function of these sites are either. The most common artefact types would associated are litchis and quern stones. Probably the most well known artefact from a fulacht fiadh is a wooden musical instrument dating to the Early Bronze Age 2120-2085 BC. This was found in 2003 in Co Wicklow placed inside of a trough. The musical instrument consisted of six worked pipes made of Yew wood.



Fig 1: Mid-ex photo of trough and wooden musical instrument.

There was no evidence of finger holes, the ends of the pipes were stepped tapered suggesting that pipes were contained in something organic. This one find does suggest that maybe some kind of joyous activities revolving around a community or a presence of a group of people might have taken place at this site, it could also simply be a good place to discard an instrument at the end of its life along side one of the last uses of that particular *fulacht fíadh*.

The experiment

Finally the brewing experiment consisted of site preparation, particular geology used, construction of the trough, malting, processing the grain, mashing and fermentation. Prior to starting this experiment the hole for the trough was dug it measured the dimensions as to what the trough was going to be it measured 1.90m x 0.60m x 0.60m.



Plate 1: Proposed site for trough.

Once the trough hole was dug, stones needed to be gathered for the experiment. Geologically speaking *fulacht fiadh* have an arrangement of stone types associated with the monument. According to Lawless et al (1995, 49) and Buckley (1990, 170-172) have stated that the majority of stones used are Granite and Sandstone. According to Condit (1990, 22) whatever geological rock type there was in the locality was subsequently used. Higgins (1991, 32) has also stated *fulacht fiadh* are associated with limestone in the Headford/Shrule area of the borders of counties Galway and Mayo. With granite, sandstone and feldspar, so freely available around the Foxford region there was relatively no problem at sourcing this material. Granite and sandstone both have different characteristics when it comes to being heated and submerged in water. Sandstone heats up a lot faster than granite due to its soft crumbly nature in comparison to granite, sandstone seems to have a shorter life span. Throughout the experiment granite on an average depending on the size of the stone could be fired five or six times minimum, whereas sandstone can only receive three to four firings before the stone would have received severe shattering or rendering them useless. Buckley (1990, 171) has stated that sedimentary rocks (sandstones) produced more waste product for the same number of firings than the igneous rocks (granite). Igneous rocks could have been reused a number of times and according to Buckley (1990, 171) has stated that this is the main reason why some *fulachta fiadh* have left slight traces because of the location of the monument

and the surrounding geology. It also has a defining reason on how big a mound will become, which often can be mistaken with a period of use a *fulacht fíadh* used entirely with sandstone could have had a longer lifespan with a smaller mound than one entirely made of granite. Limestone was undesirable because when heated and submerged in water it realises calcium hydroxide. Once calcium hydroxide has come into contact with proteins or salt which is subsequently in beer this will create ammonia, but if the ammonia comes in contact with water this creates alkaline water, too much alkaline water or very high levels can be very bad for a person's health. All of the characteristics are present during mashing in the trough to create this type of water when making beer in the *fulachta fíadh*.



Plate 2: Traditional box joints used to construct wooden trough.

Due to time restrictions and finance available, green wood pine was used for the construction with traditional box joints. Whilst all this was taking place the malting of the grain was taking place. Barley was the chosen grain for brewing the beer, in antiquity and modern brewing barley is the most popular, for which beer is made (Nelson 2005, 2-3). According to Hornsey (2003, 16) has stated that early civilizations such as Mesopotamia had access to barley and wheat, which would be regarded as the preferred grains by most brewers and which are the grains most likely to be used in producing what most Western civilizations would term or define as "beer". Barley especially when malted is very nutritious and contains both enzymes *a* and *b-amylase* both of which are necessary for adequate starch breakdown. The process of malting is essentially the breakdown of these starches and converting them into fermentable sugars. Barley seeds contain significant amounts of each enzyme, one of the reasons for it being the preferred grain for beer making (Hornsey 2003, 13). These are the main reasons why barley has been chosen for the actual experiment.



Plate 3: Picture of un-milled and un-malted barley.

25 Kg of barley was used for this experiment. Malting, generally speaking is when a grain is allowed to begin germination but is then halted by heat treatment. The first stage of malting is by placing the 25 kg of the whole barley into buckets which was used subsequently to soak the water for three days to absorb moisture, where the grain swells and softens this will encourage germination. Essentially according to a Berry (1982, 30) has stated that the surplus water is drained off and the grain is then malted or germinated in large drums which allow easy control of warmth and ventilation. This method is applied to a modern day brewer who has the proper equipment and not to a Bronze Age brewer. The Second stage consisted of draining the left over water and let the grain dry for another two days. The third stage was the same as the first stage soaking the grain for a further two days instead of three, by this time the acrospire, is still within the husk and was about three-quarters the length of the grain this is known as green malt.



Plate 4: Germinated grain also known as Green Malt.

The husk is still a valuable component of the make up of the grain at this time because during heat treatment it is the husk, which protects the grain and the enzymes which breakdown the starch. Essentially there is a two-step breakdown of starches during the brewing of beer for example during malting and during mashing when starch is been converted to sugar, which essentially leads to fermentation where yeast consumes the sugar that turns it into alcohol (Hornsey 2003, 13) and (Nelson 2005, 1-3). Essentially the malting of grain is probably the hardest process to a Bronze Age brewer. The actual heat treatment subsequently would make it incredibly hard. It is at this stage depending on the amount of heat achievable and maintainable for long periods, influence the type of malt created. According to Berry (1982, 30-45) the control of temperature influences the style of malt created such as pale malt or dark. To create dark malt temperatures reaching over 100 degrees centigrade and pale reaching 80-85 degrees. To a Bronze Age brewer these types of temperatures might not be attainable at a simple hearth; a kiln would have been needed, to reach these temperatures and to maintain them (Dornbusch 1998, 116-118). It is at this stage different flavours can be treated and a whole range of malts could be produced, in other words if there were variations in the temperature inside the kiln, the Bronze Age brewer would have a different tasting beer every time due to the heat treatment it received prior to mashing. Essentially there are various different types of malt that can be achieved such as Vienna malting, Munich malting

and Crystal malting but all of these malts subsequently need to be heat treated and temperatures maintained for over 24 hours. This probably was not impossible to the Bronze Age brewer but it would have taken a huge effort to produce, for example the production of the malting kiln and the materials need to heat the kiln would have been a problem. Probably a more likely situation is that the malting would not have lasted twenty-four hours like the professional malters of the modern era, malting probably lasted around twelve hours starting off at relatively low temperatures and increasing near the end of the process creating pale malt. Fundamentally the best type of malt to produce according to Berry (1982, 46) is a "Pale Malt". The main fact to remember is that the basic malt of all brewing from which the strength of the beer is derived, is pale malt, simply because this gives the highest yield. Longer the malt is roasted the lower the yield, thus pale malt is employed to obtain strength and workability during mashing. The final stage of malting was carried out from the instructions of J.J Berry book home brewed beers and stouts. Prior to this Michael James O'Hara co owner of O'Hara's bakery gave permission of the use of one deck oven for the malting of barley. The only reason O'Hara's bakery was asked is due to the fact that 25 kg of barley had to be heat treated this would have taken a extremely long time if attempted on a house hold oven were as the one deck oven could hold the 25 kg comfortably.



Plate 5: Picture of malted barley.

Before mashing could take place, the 25 kg of malted barley needed to be cracked, to render the starch freely available. The Malted barley was un-milled and needed to be ground or crushed essentially cracked. According to Berry (1982, 86) "cracking" means crushed rather than ground which will make clarification difficult. According to Dickson (1990, 35) loose grinding with a quern stone was a useful way to remove the husk. The final product after milling and cracking the grain is known as the grist. Realistically this process is not hard to produce, not like malting, but it is labour intensive and an essential part to the brewing of beer, by not producing grist the husk will not be separated which will lead to a shorter shelf life, depleted nutritional value and the wort will have a bitter taste. originally to the Bronze Age brewer a saddle quern would have been used to crack the grain but to time restrictions I used a food processor.



Plate 6: Picture grist the final product prior to mashing.

With the barley malted and milled the trough was placed in the hole dug prior and the granite/ sandstone was placed around the trough to make it look more authentic. also giving easy access to the stones when needed.



Plate 7: Picture of fulacht fiadh site.

The next stage of this experiment would be known as mashing. Mashing is the brewers term for adding malted grain to water which is heated to allow the enzymes to break down the starch

in the grain into sugars. Its Pretty much the process of trying to create as much sugar as possible for fermentation. The fulacht fiadh in this experiment was used to heat water to 68 C this is the optimum temperature for starch to be converted into sugar. This is probably one of the most important stages in making beer. The use of a fulacht fiadh are ideal for mashing because the trough can hold large volumes of water its also a source of heating the water and controlling the water temperature. The first stage was filling the trough with water, we used between 40 and 48 gallons of water. Whilest this was taking the place the first of two fires was lite, a mixture of granite and sandstone was placed in the fire.



Plate 8: Picture of hearth heating stones.

The stones were heated in each fire between two hours and hour and half depending on the need and availability to

maintain the temperature between 60 to 68 C degrees. The desired temperture for mashing is between 60 to 68 C. According to Berry (1982, 31) enzyme activity is extremely sensitive to temperature change, so by varying conditions during mashing the brewer is able to vary the wort and therefore the resultant beer. The optimum temperature in the mash tun must be between 60 and 68 degrees centigrade (Berry 1982, 31). After an hour and half to two hour the first batch of stones was added to the trough the water original temperature was 10 C and rose to between 25-30 C.



Plate 9: Hot stones been submerged to increase temperature of water.

This process of adding hot stones and removing cold ones from the trough continued until the mashing process was complete. Once the temperature was between 60-68 C it had to be maintained for the mashing to take place, the water

temperature could not be let go below 60 or above 70 whilst the malted grain was been added. During this process a perforated bag was used to aid in the extraction of enzymes and starch from the grain. Once the 25 Kg of Barley was added this temperature had to be maintained for an hour and half or two hours.



Plate 10: Wort been brought to a boil.

Once the two was achieved the wort (liquid) was brought to a boil. it's at this stage that various different flavourings and ingredients are added such as heather, bog myrtle, strawberries, apple skins and blackberries were used in different combinations for the two different beers that were brewed. These ingredients were used because they were available at this particular time of the year in which the experiment took place. This also means that different seasons in the year different types of beers would have been created. The wort was boiled for an hour and let cooled, the whole process took between eight and ten hours to complete. Once cooled enough the wort was filtered into fermentation buckets. The gravity was also measured at this stage to give an indication when fermentation has ended. The gravity was measured with a hydrometer, the entire fermentation process took between 7-12 days to complete.



Plate 11: Fruit flavourings used to encourage fermentation.

With the fermentation complete the beer was bottled and the two different labels for the two beers (Poll Ólta) meaning drunken hole and (Carraig Dóigh) brunt rock were created.



Plate 12: Picture of final product the actual beer and label created for this project.

Conclusion

This experiment has proven that large quantities of cracked malted barley could be mashed into sweet wort, which could be converted into an alcoholic beverage by using a *fulachta fiadh*. *Fulacht Fiadh* is an enigmatic monument with little diagnostic artefacts to aid in the interpretation for the function of the monuments. Through all the various different theories and the early Irish literary evidence, it is clear that the *fulachta fiadh* are a multi-functional site. Depending on the attitude and determination of the community or group of people who were using the *fulachta fiadh* almost anything could be achieved. We, as archaeologists would be foolish not to try to reinterpret

the function and the ideology of the monument due to the lack of information present. Although there is, little evidence to suggest the presence of brewing there is equally a lack relating to the *fulacht fiadh* being used as cooking sites. Brewing beer in the Bronze Age would not have been a hugely difficult process. It would certainly have been a labour intensive but the final mind alerting and nutritional product would have been rewarding. There is a lot of reliance on certain aspects which could have gone wrong and jeopardised the final product, such as the growing and harvesting of the grain, malting, mashing and fermentation are all vital components. The actual germination and malting of the whole barley was a success, the soaking and drying of the grain to encourage germination was a very easily activity to accomplished. The mashing in a trough is a very effective way of converting the malted barley into sweet rich wort. Fermentation is a subject, which needs further study. Could beer or an alcoholic beverage be produced all year round? If so what methods and plants did the prehistoric brewer use? If yeast was only seasonally available, this has suggested that the brewing and consumption of alcohol was possible only from spring-autumn feasting and ritualistic affairs. *Fulachta Fiadh* could have been used for brewing beer, although it is highly unlikely that these monuments were used only for this process; *fulachta fiadh* could have been used for a variety of functions. They are the most common prehistoric monument type in Ireland with 5000 examples. Further research and more care is needed when excavating these

monuments which might give light to a particular activity or are we looking at Irelands first breweries.

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