pH analysis of Burnt Mounds: Implications for preservation of organic material

N9/N10 Kilcullen to Waterford Scheme
KILCULLEN TO CARLOW

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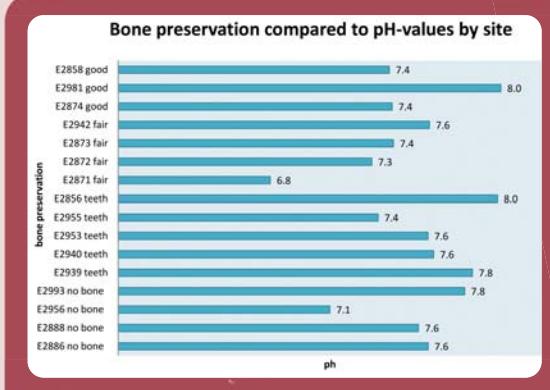
It has been proposed that the pH levels of burnt mounds and their associated deposits and features may be a factor in the preservation of bone. It was our intention to test this hypothesis using samples from burnt mounds across a number of sites on the N9/N10 Kilcullen to Carlow Road Scheme. Sixteen sites and sixty-four contexts were utilised in the study.

Methodology

The pH levels of contexts associated with burnt mounds were recorded utilising standard laboratory procedures (Gale and Hoare 1991, 275-283), using samples suspended in water and an electronic pH-meter. The presence or absence of bone from these sites and contexts was recorded, and the preservation of the bone material was classified using a four-grade scale (Excellent, Good, Fair, Poor). This classification was not applicable for teeth, which consists of enamel - the most durable skeletal element.

Samples from burnt mound being tested for pH value

pH - scale



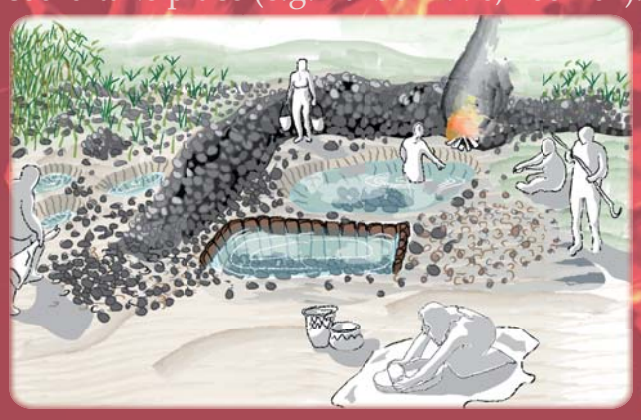
Results

No correlation was found between the presence of bone and the pH levels of the deposits. It should be noted that almost all of the samples tested for this study were found to be in the mild- to moderately- alkaline range. The average pH values of all samples from sites with bone material and those without bone were almost identical (pH 7.6 and pH 7.5 respectively). Moreover, there was no statistically significant difference in the average pH levels of contexts containing certain levels of bone preservation (P 0.167895). Finally, average pH levels from certain feature types (e.g. burnt spreads, troughs, pits) also did not present statistically significant differences (P 0.050248).

Cattle humeri -
L: Good preservation
R: Poor preservation

Discussion

Though these are preliminary results, it seems that there is no correlation between the pH of the deposits and the preservation of bone within them. Other factors may then be responsible for the varying degrees of bone preservation on these sites e.g. bacterial action, aeration or drainage (Lyman 1994, 421). The other possibility is that bone was not deposited on these sites, even if animals and their products were being utilised. Meat may have been transported on the bone to other locations for consumption or left lying on the surface and destroyed before deposition could take place (e.g. Barber 1990, 100-101). Of course, the possibility remains that not all of these sites may have had any animal products present at any time.



Burnt mound reconstruction (Jonathan Millar)

What is a Burnt Mound?

Burnt mounds (*fulachta fiadh* in Irish) are the most common archaeological site type in Ireland, and their use remains somewhat enigmatic. They generally date to the Bronze Age although some have been dated to the Iron Age & Medieval periods. A typical burnt mound consists of one or more troughs associated with a low mound of heat shattered stone and charcoal, however stake-holes, post-holes, hearths and pits are also commonly found in association with these sites. The trough would have been filled with water, which was then heated by placing hot stones into it.

Burnt mound with post-holes surrounding trough

Burnt mound

Burnt mound trough under excavation

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