Traditional Charcoal Making

Experimental Archaeology

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http://charcoal.seandalaiocht
INTRODUCTION
In recent years archaeological excavations right across the country, especially on National Roads Schemes such as the M7/ M8, N21 and K-E-K M4, have uncovered an abundance of evidence for charcoal production in the early and late medieval periods; giving us an opportunity to explore early charcoal production practices.

The goal of this experimental archaeological project is to further investigate early medieval charcoal production activities by reconstructing and operating a charcoal production pit kiln. The reconstructed pit is based on an early medieval charcoal production pit excavated (by Ellen O’ Carroll with IAC Ltd) in the townland of Russagh, Co. Offaly on the N6 Kinnegad to Athlone road scheme (see below).

MAIN AIMS:
- To reconstruct, fire and control an early medieval charcoal production pit kiln
- To understand more clearly the processes and skills involved in traditional charcoal production.
- To analyse how productive pit kilns were by measuring the fuel wood input versus the charcoal output (both in terms of volume and weight).
- To produce oak charcoal for use in a subsequent iron smelting experiment to be carried out in the National Heritage Park, Ferrycarrig on the 6th and 7th March (see http://smelt.seandalaiocht.com).
- To test if charcoal making was possible in winter conditions or if it would have been practiced at a different time of year.
- To return and excavate the pit at a later date in order to compare the remains with excavated archaeological sites.

METHODOLOGY
Essentially we plan to dig a pit in the ground based on the sub-rectangular pit excavated at Russagh (see below). We will then stack the pit with oak timbers, cover these with green vegetation and soil and light it.

While this may seem straightforward, there is (apparently) some skill in the stacking of the wood to allow a firing space as well as in controlling air flow through the kiln throughout the process.

This may prove tricky and the experiment could easily end up in tears and flames! However, fingers are crossed and hopefully all will go well.
TRADITIONAL CHARCOAL MAKING
In western countries such as Britain and indeed Ireland, charcoal was produced in traditional earth kilns right up until the first half of the 20th century. There were two main types of traditional earth kilns: the pit kiln (Fig. 1) and the mound kiln (Fig. 2). Excavated charcoal kilns in Ireland have generally been identified as of the pit-type. This is largely due to the difficulty in identifying mound-types which would leave little trace in the subsoil.

Charcoal production using traditional methods continues in some parts of the world and is known from historical sources and ethnographic accounts. See below for some examples.
Traditional charcoal production pits under construction in Madagascar
A 16th century depiction of the two main types of traditional earth kilns (pits and mounds) used for charcoal production.
Traditional circular shaped mound kilns in early 20th century Britain
Tree felling and charcoal production in Western Thailand

(Photos Niall Kenny)
Other Mound Kilns

Traditional mound kilns (charcoal production mounds) in operation near Pondicherry in south-east India (Photo Chris Adam)

Vegetation and soil covered circular mound kiln from Bad Kohlgrub in south Germany (Photo Chris Adam)
RUSSAGH 4 CO. OFFALY – Charcoal Production in early medieval Offaly
Recent excavations in the townland of Russagh, Co. Offaly have revealed evidence for the production of charcoal, most likely for use in the smelting or smithing of iron. Area B revealed evidence for two charcoal production pits, one circular and one (the prototype for this experiment) sub-rectangular.

The sub-rectangular pit measured 1.40m x 0.91m x 0.21m and was AMS dated to AD 994-1153 (calibrated 2 Sigma). A similar early medieval date for the circular pit-kiln suggests the two were contemporary. Charcoal analysis from the two pits indicated the deliberate selection and use of oak. This is not unusual and oak appears to have been the preferred wood for charcoal production. This is probably due to its high calorific values (allowing it to burn for longer/at a higher temperature) and the fact that it does not crumble as easily as softwoods.

Plan of the pits excavated at Russagh (Image IAC Ltd)
Section of the sub-rectangular pit excavated at Russagh (Image IAC Ltd)
Mid excavation and post excavation photographs of the charcoal production pit kiln from Russagh 4 Co. Offaly
(Photos IAC Ltd)
OTHER CHARCOAL PRODUCTION PITS EXCAVATED IN IRELAND

Mid-excavation (south-west facing) photo of a rectangular shaped charcoal production pit at Kilbeggan South 3, Co. Westmeath excavated on the N6 road scheme (Photos IAC Ltd)
Mid-excavation and post-excavation photos, plan and section drawing of a sub-rectangular shaped charcoal production pit excavated at Trumra 3, Co. Laois (Photos ACS Ltd)
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