

**Archaeological Excavation
at
Woodstown, County Limerick**

Licence Number: 01E0762



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PLEASE NOTE...

*That the archaeological recommendations, mitigation proposals and suggested methodology followed in this report were first formulated and approved by the National Monuments and Architectural Protection Division, *Duchas*, Dun Sceine, Harcourt Lane, Dublin 2, prior to the commencement of the archaeological dimension of the project.*

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I. Abstract

This report details the archaeological resolution of a burnt spread identified in the archaeological licensed monitoring of topsoil stripping during the construction of the Southern Limerick Ring Road.

The site was originally noted as a spread of burnt soil, shattered stone and charcoal, *circa* 12m in diameter, at the north-western edge of the road take. Following identification the site was cordoned off and a license was applied for to the Licensing Section, Duchas – The Heritage Service.

The excavation of the site was undertaken by the writer over the course of four days from the 7th-10th August under license number 01E0762.

The project resolution was funded, in full, by the client.

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III. Abbreviations and Terms Used in Text

Bank Right bank and left bank of a river or stream may be determined when one looks downstream, i.e. in the direction that the river is flowing. It may also be an earthen 'wall' around an enclosure, often associated with a ditch.

Barony, Parish, Townland These terms refer to land divisions in Ireland. The barony is the largest land division in a county, which is formed from a number of parishes. These parishes are in turn made up of several townlands, which are the smallest land division in the country. The origins of these divisions are believed to be in the Early Medieval/Christian period (AD500-AD1000), or may date earlier in the Iron Age (500BC-AD500).

Context Each feature found during the excavations is allocated a number, commonly termed a 'Context Number' in order to record the archaeology.

Ditch A cut feature forming an enclosure and associated with a bank in some cases.

First Edition This relates to editions of the OS 6 inch maps for County Limerick. The first edition map completed for the area dates to the early 1840's and this is referred to in the text as the "first edition".

Fosse Alternative word for ditch

G.S. Grid square

LI - This number is the number of the site on the RMR map (see below). It begins with the county code, here LI for Limerick, the 6-inch sheet number, followed by the number of the archaeological site.

M Metres, all dimensions are given in metres or part of a metre, unless otherwise stated

OS Ordnance Survey

Ph Parish

RMP Recorded Monuments Places. An update of the older SMR, (sites and monuments record), on which all known archaeological sites are marked and listed in an accompanying inventory. The sites marked afford legal protection under the National Monuments Acts 1930-1994. The register is based on the 6 inch map series for the country and is recorded on a county basis.

Sheet This relates to the six inch map for county Limerick which is divided into sheets. This project is concerned with sheet numbers 30.

Td Townland

Tumulus Term used to describe an earthen mound with no apparent enclosing ditch.

1. Introduction

1.1 Background to Excavation

The feature at Woodstown was first noted during the course of licenced monitoring of the Southern Limerick Ring Road. The site was originally noted as a spread of black soil, fire shattered stone and charcoal, extending over an area of around 12m in diameter.

The site was located at the north-western edge of the road take approximately 1km south-west of the Annacoty - Cappamore road. No trace of the site was visible above ground prior to the commencement of top soil stripping.

1.2 Location & Topography

The site is located on rising ground in undulating demesne lands in the townland of Woodstown, in the parish of Killeenagarrieff. Townland: According to the Civil Survey for Limerick (Simington 1938) and the seventeenth century Down Survey Map for Limerick, Woodstown was not a townland in 1655. It is thus possible to suggest that this townland was one of the new divisions made when the country was first surveyed in the 1840s, when frequently estate lands became townlands in their own right.

At the north-west end of the townland on the right bank of the Mulkear River, on an eminence, are the ruins of the original Woodstown House, built by the ancestors of Major Gough. Now, the school at Lisnagry, uses the second estate house, once called Mulkear House on the first edition OS map, but subsequently called Woodstown House. From the cartographic evidence coupled with the field-walking of the archaeological reconnoitre, it was realised that the townland is full of estate features relating to the management of the estate in the past.

The site is in an area of carboniferous limestone of the upper group of dark, well bedded, clayey limestones. The upper limestone of this area is structured into blocks, separated by north-south and east-west channels. The floors of these channels are made of black, pyritic limestone, with chert bands within the blocks of limestone.



Figure 1. General location map of Woodstown (after Discovery Series No.65)

In two areas of County Limerick the upper limestones are interrupted by volcanic outflows, when lava oozed from several vents in the rock. This created basalt and other igneous rock types and, with water action, conglomerates were formed from a mixture of lava, sills, ash and limestone, cemented together with lime. Some of this igneous rock, in the form of marble, was quarried in Ballysimon in the last century.

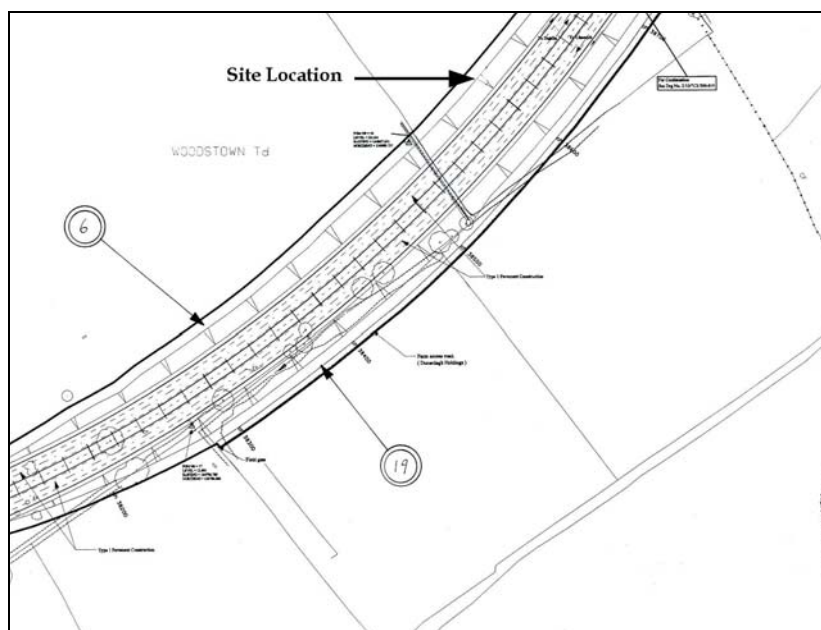


Figure 2. Location of the site on the road take (map supplied by client)

The soils in the area vary, there are areas of brown earth soils, which are well drained mineral soils, and poorer gley classification type soils. However, correctly managed, these gley soils can support pasture (Finch & Ryan 1966, Nevil 1972, Lamplugh 1907).

1.3 Historical Background

Lewis has spelt this parish name as “Kilnegarruff”, and there are many derivatives on the name in the sources. This parish is partially in the liberties of Limerick City. The name in Irish is “*Cillín na nGarbh*”, translated as the little church of the rough people. O’Donovan states, however, that it is more likely to be a corruption of “*Cillín*”.

The parish is comprised 2900 acres, with the land varying from bog, to sterile land to very fertile pasture. Towards the west end of the parish, some very wealthy plantations have been created as part of the Earl of Clare’s demense. The principle seats of the parish were: Thornfield owned by Major General Sir Richard Bourke, Woodstown, Major Gough, Mulcaher, Rev. J. Crampton, and Rich Hill owned by Mr W. Howly.

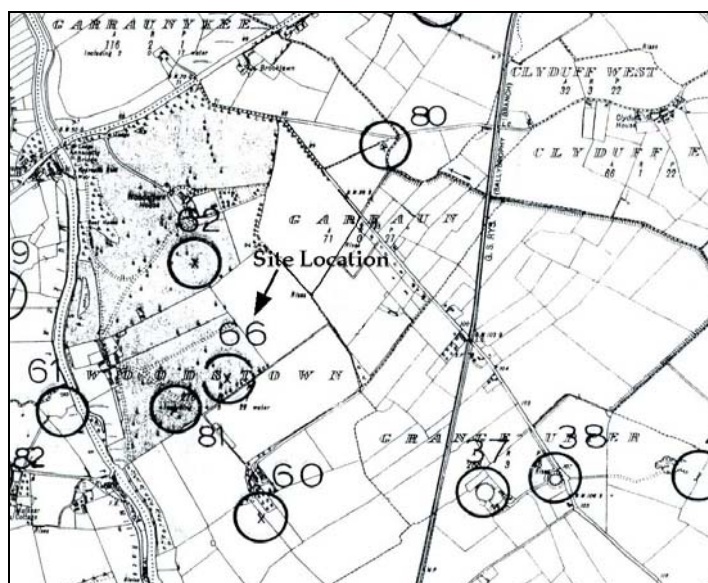


Figure 3. The RMP for the area with site location marked

The parish church is located in the townland of Killeenagarriff but was destroyed in AD1641 and rebuilt, but was ruinous by the 1800s. The RC divisions of the parish has a parish church at Ahane, which still stands today (Lewis 1837, 189-90, O'Donovan 1840a, 8-9, 1840b, 28-30).

1.4 Excavation Methodology

The resolution project of the features at Woodstown was run in accordance with guidelines as set out by English Heritage in its policy document *Management of Archaeological Projects* (1991). Below is the project pathway that was followed:

- ◆ Phase 1 Project Plan
- ◆ Phase 2 Fieldwork (on-site resolution)
- ◆ Phase 3 Assessment of Potential for Analysis
- ◆ Phase 4 Analysis and Report Production
- ◆ Phase 5 Dissemination

Phase Two- the site excavation, by hand, of the sites, used an amended version of the MoLAS (Museum of London Archaeological Service 1994) system of context recording. This is a method of excavation that has been used in Britain since the 1970s and has proved to be very successful, in both the efficiency of on-site recording/excavating and in the formation of the report in post-excavation.

1.5 Excavation

The writer carried out a full excavation of the site over the course of four days. The road construction removed the topsoil/plough soil during the monitoring stage of the project. Once revealed the site was then excavated by hand.

2. Context List

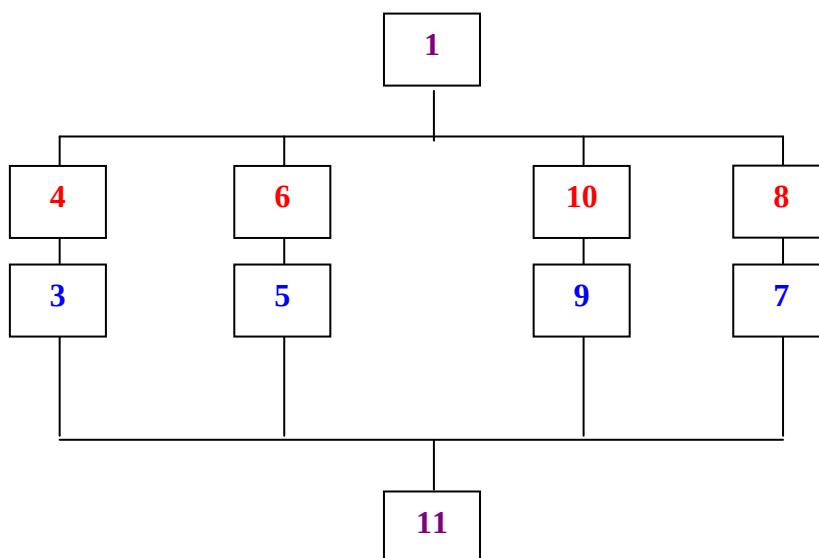
Context Number	Description
1	Light brown topsoil
2	Black soil, shattered stone and charcoal
3	Cut of drain filled by [c.4]
4	Fill of cut [c.3]
5	Cut of drain filled by [c.6]
6	Fill of cut [c.5]
7	Cut of large depression/pit filled by [c.8]
8	Fill of depression cut [c.7]
9	Cut of drain filled by [c.10]
10	Fill of drain cut [c.10]
11	Basal boulder clay

3. Stratigraphic Sequence

3.1 Matrix

The first stage of report compilation is the formation of the site matrix. This structure collates all the contexts that have been excavated and recorded, and preserves their stratigraphic relationships in flow chart fashion. The entire interpretation of the site rests on this visual manifestation of the archaeology as excavated. The contexts of the matrix are then grouped and segmented to create features and phases, all of which are described in detail below (section 3.2 Context Descriptions and section 4: Stratigraphic Interpretation).

Matrix



Key to Matrices	
Red:	Fill
Blue:	Cut
Green:	Deposit
Purple:	Layer

3.2 Context Descriptions (Fig. 4; plates 1-5)

The location of the major features can be seen in figure 6 below. The descriptions are referenced to the relevant matrix, found in section 3.1.

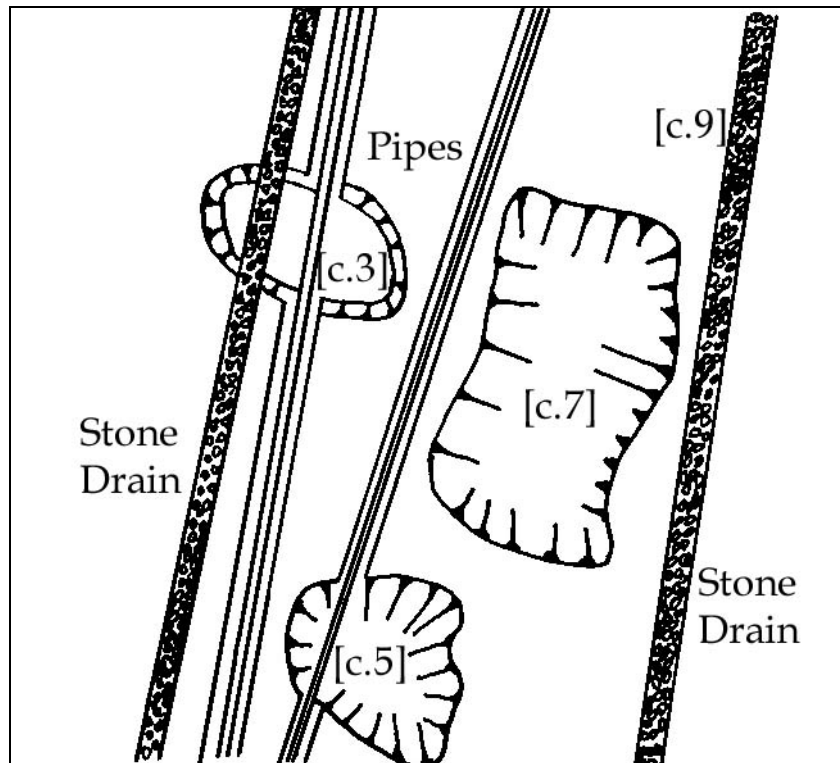


Figure 4. Plan of excavated features (Scale 1:100)

Context 1

A loose, light brown topsoil, with occasional stone inclusions. It extended over the entire 12.5m square area intermittently with a maximum depth of 0.28m.

Context 2

A loose, black/grey soil with fire shattered red sandstone and occasional charcoal flecking. This material extended over much of the excavated area to varying depths, the greatest depth being 0.33m. This deposit generally underlay the topsoil [c.1] and overlay the basal boulder clay [c.11].

Context 3

A long linear cut running NW-SE, across the excavated area, it was on average 0.4m wide and 0.20m deep. Approximately 1.90m from the NW extent of the cut it broadened out into a sub-circular pit/depression, measuring 2.70m X 1.60m and 0.30m deep. A modern red clay

drainage pipe runs the length of the cut , while an earlier stone filled drain is visible in the base of the sub-circular depression, 0.34m south-west of and running parallel to the drainage pipe.

Context 4

A compact, yellow/grey/black re-deposited boulder clay, grey silt and burnt material [c.2] containing shattered stone and occasional charcoal. This material filled the cut [c.3].

Context 5

A linear cut which runs in a NW-SE direction, parallel to [c.3] and, again, runs across the excavated area. The cut is on average 0.5m wide and 0.35m deep. Approximately 4m from its south-eastern extent the cut broadens into an irregular pit/depression, measuring 2.5m X 2.0m and 0.56m in maximum depth. The cut contains a modern red clay drainage pipe.

Context 6

The fill of the linear drain cut [c.5] was the same as [c.4] which filled the drain cut [c.3] and consisted of a re-deposited boulder clay, grey silt and burnt mound material [c.4].

Context 7

Cut of a large depression in the north-eastern half of the excavated area, measuring 4.6m X 2.6m. The depression sloped down to the north-east and was shallowest in this area, it greatest depth being at its south-western extent, where it was 0.31m deep.

Context 8

Fill of the cut of depression [c.7]. It was composed in the main of burnt mound material [c.2] containing fire shattered stone, black soil and occasional charcoal, intermixed with boulder clay and topsoil.

Context 9

A linear cut running in a NW-SE direction across the excavated area. The cut was on average 0.34m wide and 0.22m deep.

Context 10

The fill of linear cut [c.9] this material consisted of a light brown, compact clay, with stone inclusions, which overlay a deposit of stones forming a drain.

Context 11

A light brown/yellow boulder clay, which was the basal soil over the excavated area.

4. Interpretation of Stratigraphy

There was no above ground trace of the site prior to the removal of the topsoil. It is located in an area of demesne land, associated with Woodstown House and it is clear that the land has undergone a certain amount of reclamation and clearance.

As already noted a 12.5m square area was excavated and this clearly showed that the burnt material [c.2] was widely dispersed and shallow in most areas.

Clearing back of the burnt material [c.2] showed that it had been spread over a wide area but that the main body of the material was located within the depression/cut [c.7] on the north-eastern side of the excavated area.

However, it is impossible to say if even this concentration of burnt material is *in situ* given that it is mixed with boulder clay [c.11] and topsoil [c.1], while the presence of burnt material in the fill of the drain cuts [c.3 & 5] also raises doubts about the antiquity of the burnt material.

The presence of drains crossing the site from NW-SE clearly indicates major disturbance of the area, while of the four identified drains only two appear to be co-eval – the stone filled drain [c.9] and the similar feature identified in the widest part of the cut [c.3] on the other side of the site.

The pipe resting in the base of cut [c.3] is composed of many short sections of red clay pipe of approximately 12cms diameter, while the pipe resting in cut [c.5] is of a much smaller diameter and is slightly deeper into the subsoil than the larger pipe. This would suggest that the uncovered drains represent three separate phases of land drainage/reclamation.

All four drains are cut into the underlying sterile boulder clay, while in the case of the narrow pipe in cut [c.5] there is a distinct grey silt layer within the fill of the cut, underlying the burnt material and overlying the basal boulder clay.

This would suggest that the burnt material is later in date, however, given the consecutive episodes of disturbance it is possible that the burnt material has been dug out from somewhere else and used as a fill in the drain cuts because of the fact that its main component is fire shattered stone, thus aiding the general drainage of the area.

Within the excavated area there is no definitive evidence for an original site, now levelled, nor can one point to a primary location for the burnt material. The most likely location for such a primary site is the depression/cut [c.7] but, as already noted, even here, where there is the greatest depth of burnt material, there are stratigraphic inconsistencies – the inclusion of both topsoil and boulder clay within the main burnt deposit – that further suggest disturbance and re-deposition.



Plate 1. The site prior to excavation from the north-west



Plate 2. The greatest depth of burnt material in the depression [c.7]

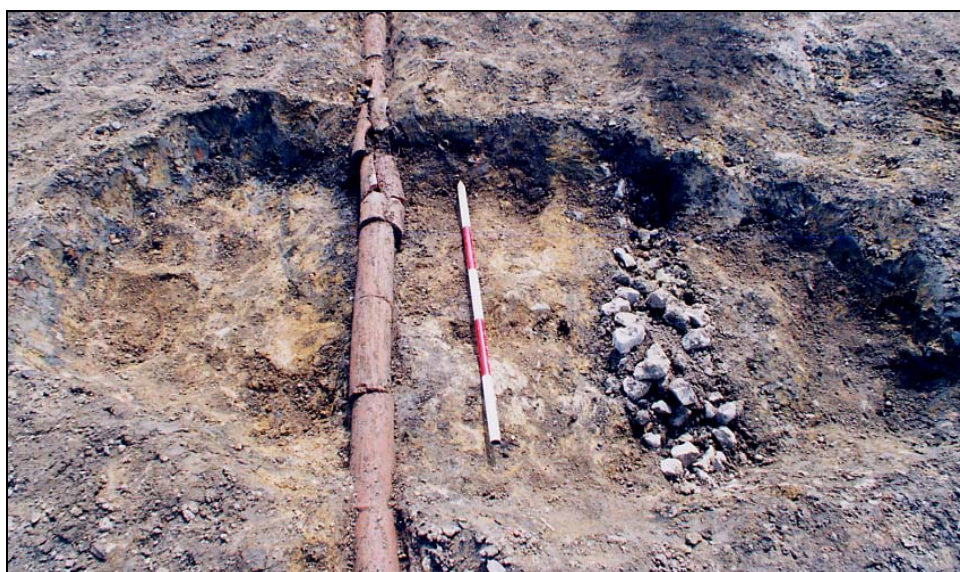


Plate 3. The pipe and stone drain in the widest part of the cut [c.3].



Plate 4. The stone filled drain in [c.9] on the north-east of the site



Plate 5. The pipes in [c.5] on the left and [c.3] from the north-west.

5. Discussion

Burnt material such as that recorded at Woodstown is very often interpreted as the remains of a *fulacht fiadh* or ancient cooking place.

Fulachta Fiadh normally manifest themselves as low, grass covered mounds, which may be horse shoe shaped, crescentic, rounded or oval in appearance. The mound usually consists of burnt or fire cracked stones with a high proportion of ash and charcoal, resulting in the covering soil usually having a blackened appearance.

Excavation may reveal a trough area, which can be constructed of timber, clay or may be stone lined. This acted as the water receptacle, where stones were placed after being heated in a fire. The heated stones then raised the temperature to boiling point. As the stones cooled, they cracked, being eventually removed and dumped beside the trough. Repetition of this process eventually led to the creation of the burnt mounds recognized today as *fulachta fiadh*.

The name *fulacht* or *fulacht fian* is found in early Irish literature, referring to the cooking places of the warriors of The Fianna. The term *fulacht fiadh* came in to currency in the last century to describe these mounds.

Their use as cooking places is by no means widely accepted and various interpretations as to their use have been put forward. These include their use as saunas or sweat-houses, for bathing, steeping hides or brewing. Though they are now regarded as the most common monument type in the country their use and to some extent their dating remains enigmatic.

There is no doubt that the burnt material at Woodstown may have originated from a *fulacht fiadh* but there is no evidence to suggest that the *fulacht fiadh* was located at the Woodstown site – no evidence for a trough or that the burnt material is *in situ*. However, the presence of

drains of different dates suggests that this area was prone to flooding and would have been a suitable site for a *fulacht fiadh*.

However, the burnt material may not be the remains of a *fulacht fiadh* and may never have been part of a larger deposit. It may only ever have been a relatively shallow spread of material the exact function of which is unclear. Indeed, the recovery of some small fragments of cremated bone from the burnt material at Woodstown is paralleled at other excavations undertaken by the writer at Newtown, Co. Limerick, Darragh South, Co. Clare and Gortatlea, Co. Kerry where there was no evidence to link the burnt material to *fulachta fiadh*.

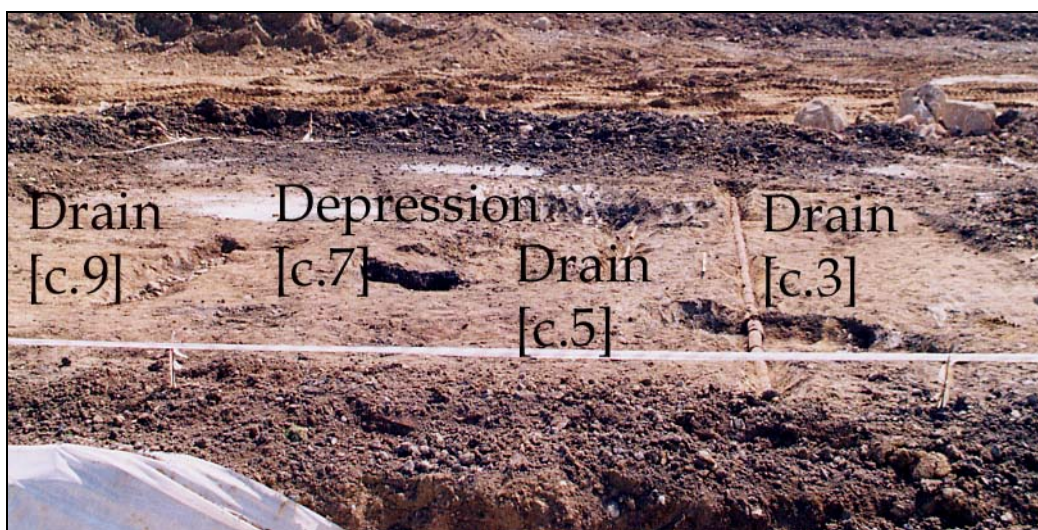


Plate 6. The site after excavation, from the north-west

In the case of Woodstown the episodes of disturbance associated with the drainage/reclamation of the area have made any assessment of the evidence extremely difficult. Indeed, the evidence would suggest that either the burnt material is not *in situ* or that it is relatively modern.

5.1 Dating of *Fulachta Fiadh*

Charcoal samples were taken from both the burnt material and, until analyses of these samples has been completed, it is impossible to suggest a date for the material.

However, analyses of radiocarbon dates from *fulachta fiadh* in 1990 indicated that the generally dated to the Bronze Age (Brindley & Lanting 1990, 56) yet this analysis was qualified to be relevant only to sites with troughs and mounds of burnt stone.

The material at Woodstown may date to this period, which would suggest that it originated in a *fulacht fiadh* mound however it could date to an earlier or later period also.

6. Catalogue of Finds

There were no finds recovered from the excavation at Woodstown

7. Sample List

An on-site sieving programme was undertaken at this site.

sample number	from context number	details	purpose of sample	treatment
1	2	charcoal	dating	sieving
2	4	charcoal	Dating	sieving

8. Conclusions

The clear and sustained disturbance of the area, probably during the nineteenth century, has made any interpretation of the Woodstown site almost impossible. It is clear that the area was prone to flooding and as such would have been a suitable location for a *fulacht fiadh* yet, there is no clear evidence to suggest that a *fulacht fiadh* ever existed on the excavated site.

Indeed, until radiocarbon dating of samples from the burnt material is completed it is questionable whether or not the burnt material is derived from an archaeological context, as the disturbed stratigraphy of the site could suggest that the burnt material is later than the drainage works.

However, in the absence of a definite sequence of events and pending analysis of the radiocarbon dating, it may be suggested that the burnt material originated from an archaeological context nearby and was deliberately used as part of the drainage works due to its percolation aiding qualities.

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10. Signing off Statement

Archaeological Firm: ÆGIS ARCHAEOLOGY LIMITED

Writers: Michael Connolly (site director and licence holder)
Tracy Collins (post excavation and report compilation)

Client Roads Design Office,
Limerick County Council

Signed: _____
Michael Connolly (Director and licence Holder)

Tracy Collins for ÆGIS ARCHAEOLOGY LIMITED

Dated: August 2001

11. Appendices

11.1 Species identification of charcoal samples of four sites excavated along the Limerick Southern Ring Road

Ellen O'Carroll

01E0852ext-Crabbsland, 01E0762 - Woodstown,

01E0484 -Peafield and 01E0056ext - Newtown B & D

Introduction

Twelve charcoal and wood samples were submitted for analysis. The charcoal was sent for species identification prior to ^{14}C dating and also to give an indication of the range of tree species, which grew in the area, as well as the utilisation of these species for various functions. Wood used for fuel at pre-historic sites would generally have been selected at locations close to the site. Therefore charcoal identifications are likely to reflect the composition of the local woodlands although human selection of specific wood types for certain functions may bias these charcoal results. Larger pieces of charcoal, when identified, can also provide information regarding the use of a species. The charcoal was excavated from two burnt mound spreads (Crabbsland & Woodstown), bowl furnaces (Crabbsland) and two *fulacht fiadh* (Peafield & Newtown D) (Tables 1, 2, 3 & 4). No dates have been received by the author but the excavated sites can be dated to the pre-historic period (Bronze Age) apart from Crabbsland (01E0852) where some medieval material and features were excavated.

Methods

The process for identifying wood, whether it is charred, dried or waterlogged is carried out by comparing the anatomical structure of wood samples with known comparative material or keys (Schweingruber 1990). The identification of charcoal material involves breaking the charcoal piece so as a clean section of the wood can be obtained. The charcoal was firstly identified to species under a Leica GZ6 x 120 stereomicroscope microscope and then under a high powered (x 450) metallurgical microscope. Where there was only a small amount of charcoal present all pieces were identified. In the case of larger samples only the large pieces of charcoal were selected from sample bags on a random basis for identification purposes.

Results

Context no./ Sample no.	Locational info.	Species	Comment & Weight
C4/ 7	Clay layer capping site	Alder, Willow & oak	Alder (20 g), Willow (7 g.) & oak (< 1 g.). Oak is bagged separately
C11/ 3	Burnt layer	Hazel, alder and ash	Hazel (3 g), alder (2 g.) and ash (1 g.)
C7 /5	Burnt mound layer	Alder	14g
C8/10	Bowl furnaces	Oak	20g

Table 1: Results from Crabbsland 01E0852, burnt mound and bowl furnaces

Context Sample no	no./ Locational info.	Species	Comment & Weight
C 4 /3	Burnt spread	Hazel , Pomoideae & Oak	Hazel (3 g.) , Pomoideae (1 g.) & Oak (1 g.). Oak has been bagged separately

Table 2: Results from Woodstown, 01E0762, Burnt spread

Context no./ Sample no	Locational info.	Species	Comment & Weight
C 11/ 1	Trough fill	Ash	3 g.
C 11/2	Trough base	Alder ?	Only tiny flecks of wood mixed with clay.

Table 3: Results from Peafield, 01E0484, *fulacht fiadh*

Context no./ Sample no	Locational info.	Species	Comment & Weight
C 2014/ 1	Burnt mound material	<i>Prunus spp.</i>	1.5 g.
C 1020/3	Fill possible hearth feature	Oak	Twigs, 5 g.
C 1031/10	Fill of an irregular cut	Oak	90 g.
C 2003/2	From deep pit/trough	Hazel & ash	Hazel (3 g.) & ash (2 g.) & weight
C 2030/	From deep pit/trough	Elm wood pieces and rooty type material	

Table 4: Results from Newtown D, 01E0056, two *fulacht fiadh*

Discussion

Wood use

There are eight taxa types present in the charcoal remains. Apart from the elm timbers at Newtown D (01E0056) and the oak associated with the bowl furnaces at Crabbsland (01E0852) there does not seem to be any patterns of selection of certain species for certain functions. The elm wood may have been used as lining for the trough while the oak selected for use within the bowl furnaces is related to the high calorific value of oak charcoal and as such would have been perfect for metalworking functions.

The remaining identified charcoal indicates that the inhabitants of the area were probably selecting kindle for use in the burnt mound material from whatever was closest to hand. The species identified from each site is presented below in percentages in pie chart format.

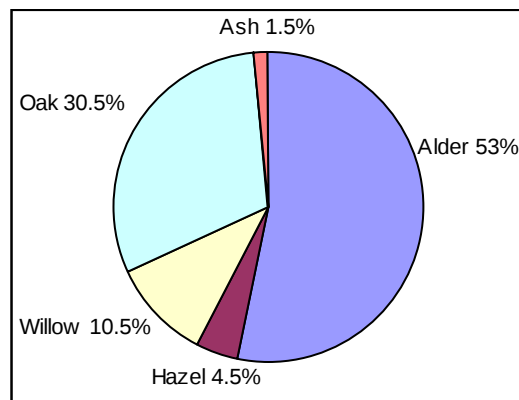


Figure 1: Species present at Crabbsland 01E0852

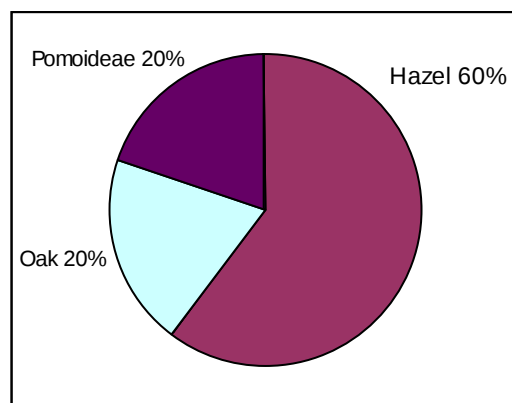


Figure 2: Species present at Woodstown 01E0762

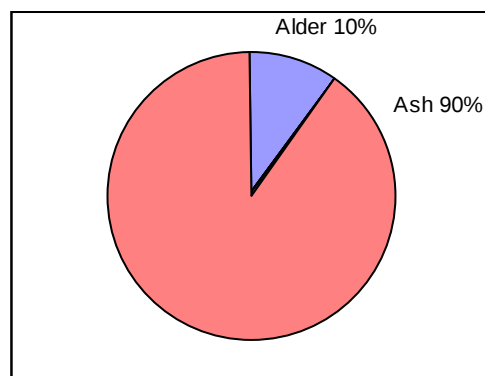


Figure 3: Species present at Peafield 01E0484

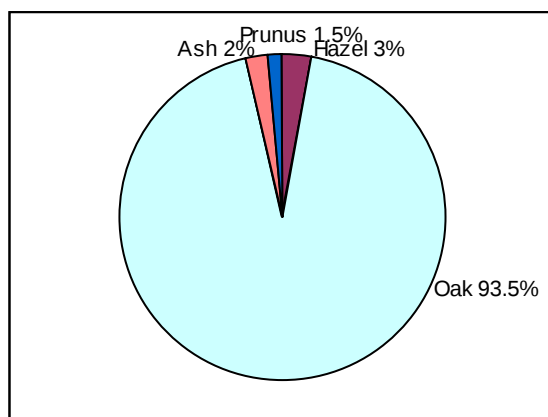


Figure 4: Species present from Newtown D 01E0056

(The elm timbers have not been included in the chart above)

The range of species identified from the *fulacht fiadh*/burnt mounds along the Limerick Southern ring road excavations includes large (oak, ash and elm) and smaller (alder, willow and hazel) trees and some scrub (*Prunus* -blackthorn type & pomoideae-apple type). The species identified above would have grown in a variety of different habitats although it is interesting to note that sites described as being located in marshy ground (Peafield & Crabbstown) have produced wetland species and species identified from Newtown D and Woodstown are mainly representative of dryland environments.

A substantial amount of oak was identified from three of the four sites. The oak identified suggests that there was a supply of oak in the surrounding environment at all periods of use.

Oak was exclusively selected for use at the site of the small bowl furnace. This pattern of usage was also seen in the samples analysed from the Kildare by-pass excavations. A series of bowl furnaces excavated at site 12 (01E0595) produced predominantly oak charcoal (O'Carroll 2001). Oak makes good firewood when dried and has a high calorific value perfect for use at metalworking sites. Throughout all periods of prehistory and history oak has also been used for structural timbers. Oak also has unique properties of great durability and strength. Sessile oak (*Quercus petraea*) and pedunculate oak (*Quercus robur*) are both native and common to Ireland. The wood of these species cannot be differentiated based on its microstructure. Pendunculate oak is found on heavy clays and loams particularly where the soil is of alkaline pH. Sessile oak is found on acid soils often in pure stands and although it thrives on well-drained soils it is also tolerant of flooding (Beckett 1979, 40-41). Both species of oak grow to be very large trees (30-40m) and can live to an age of 400 years. The oak could have been selected from mixed woodlands nearby.

Alder was identified from Crabbsland and Newtown D. It is a widespread native tree and occurs in wet habitats along streams and riverbanks. Alder grows regularly on fen peat and was also identified, albeit in smaller quantities from Crabbsland. It is an easily worked and split timber and does not tear when worked. The Alder is commonly identified from wood remains associated with wet/boggy areas.

Prunus was only identified from Newtown D. The genus *Prunus spp.* includes *Prunus spinosa* (blackthorn), *Prunus avium* (wild cherry) and *Prunus padus* (bird cherry). Wood of the genus *Prunus* can be difficult to differentiate microscopically. Wild cherry and blackthorn are more common in Ireland than bird cherry. There is very little archaeological evidence for the use of cherry wood in Ireland although the wild cherry tree is commonly found in many hedgerows (Nelson 1993, 167). It is a very durable wood and is as strong as oak. Blackthorn (*Prunus spinosa*) is a thorny shrub found in woods and scrub on all soil types. In a woodland situation it is more likely to occur in clearings and at the woodland edges. It is more likely that the charcoal identified from this assemblage was blackthorn rather than cherry. If this is the case then the collection of blackthorn was probably the selection of scrub from nearby to the site in hedgerows and open clearings.

A small amount of willow was identified from Crabbsland. Willow is a species native to Ireland and can be found in a tree or shrub form. According to Webb (1971,160-2) 13 species of willow are found growing wild in Ireland, of which 8 are certainly native. The wood of *Salix* trees and shrubs cannot be differentiated on the basis of anatomic characteristics. It is a strong

wood in tree form and is commonly used for wooden posts. All willows appear to favour wet conditions.

Ash was identified from three (Crabbsland, Peafield, Newtown D) of the four sites analysed. It is a native species preferring lime-rich freely draining soils. It is not a very durable timber in waterlogged conditions but has a strong elastic nature. It is easily worked and lends itself well to a range of different requirements like the turning of wooden bowls.

Elm timbers were identified from the deep pit/trough at Newtown D. The timbers appeared to have been split and they may have formed the lining of the trough. Comparative material can also be found along the same road scheme at site Newtown A and E where elm was identified from a stake at the fulacht site (OCarroll 2002). English elm (*Ulmus procera*) and wych elm (*Ulmus glabra*) cannot be separated by their wood structure. Elm was thought to have declined or died out with the advent of farming or from the elm disease caused by the fungus *Ceratocystis ulmi* around 3700BC. It has been identified from other assemblages including trackways, artefacts and charcoal from Lambay in Co. Dublin (OCarroll 1999). It is probably true to say that although it declined it probably did not die out everywhere and some pockets of native Irish elm still survived. Elm generally prefers damp woods particularly on limestone.

Pomoideae, which was identified from the samples retrieved from the Woodstown excavations, includes apple, pear, hawthorn and mountain ash. It is impossible to distinguish these wood species anatomically but as wild pear is not native and crab apple is a rare native species to Ireland it is likely that the species identified from Woodstown are hawthorn or mountain ash (rowan) (Nelson 194-200, 1993). Hawthorn (*Crataegus monogyna*) is a native species, and is found in many hedgerows throughout Ireland. Mountain ash (*Sorbus aucuparia*) is also a common tree to Ireland growing particularly well in rocky and hilly mountainous places.

Hazel (*Corylus avellana*) was identified from Crabbsland and Woodstown. Hazel was very common up to the end of the 17th century and would have been used for the manufacture of many wooden structures such as wattle walls, posts, trackways and baskets. McCracken (1971, 19) points out that "it was once widespread to a degree that is hard to imagine today". With the introduction of brick, steel and slate the crafts associated with hazel became obsolete, and today the woods that supplied hazel have diminished rapidly. Hazel is normally only about 3-5m in height and is often found as an understory tree in deciduous woods dominated by oak. It also occurs as pure copses on shallow soils over limestone as in The Burren in Co.

Clare and survives for 30 to 50 years. Its main advantage is seen in the production of long flexible straight rods through the process known as coppicing.

Conclusions

A total of eight species were identified from the four sites investigated. Elm may have been selected for the lining of the deep pit/trough associated with Newtown D and oak appears to have been exclusively used at the site of the small bowl furnaces at Crabbsland due to its high calorific value. Apart from the elm and the oak described above there does not seem to be any other patterns of selection of certain species over others at the investigated sites.

The local environment of the sites includes a mosaic of different habitats. Crabbsland and Peafield produced a greater quantity of wetland type taxa when compared with other sites which may be indicative of the type of terrain the sites were located in. Alder and willow indicate local wet condition along river banks or peat bogs. The oak may also have grown on wetter lands during drier periods. The remaining two sites (Woodstown & Newtown D) produced predominantly dryland species, which also suggests that the inhabitants of the sites were collecting, kindle which was close by to the site. The ash, elm and hazel would have grown in drier conditions preferring free-draining soils and nutrient rich clays. Woodstown and Newtown D were described as being located on drier soils as opposed to the marshy environ of Peafield and Crabbsland.

The hawthorn/mountain ash and *Prunus* spp. identified at from the sites are indicative of those species, which may have grown locally in hedgerows or as scrub nearby to the sites. Apart from the elm at Newtown D and the oak from the bowl furnaces at Crabbsland, the pattern of wood identifications most likely reflects localised gathering of wood for use at the *fulacht fiadh* and burnt mound sites and represents tree types growing in the local environs of the analysed sites.

Radiocarbon dating

All of the charcoal samples represent the inner part of a tree of unknown age and it was not possible to tell from identification how much larger, if at all, the whole piece was. As a result «The old-wood effect» may need to be taken into consideration when ¹⁴C dates are returned (Warner 1979, 159-172). This is particularly true in the case of oak as it can grow to an age of 300 to 400 years. The samples identified could be of a more recent date than the rings

represented on the sample. It is better to send shorter living species such as alder, willow and Prunus for ¹⁴C dating.

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