Final report, Mooretown, Swords

MCGLADE 01/09/2021 19E0287 FINGAL PLANNING REF. F18/0163

archaeology plan
HERITAGE SOLUTIONS

SITE NAME

Rathbeale Rd., Mooretown, Swords, Co. Dublin

CLIENT

ABM Europe Ltd., Unit 2B, Feltrim Business Park, Drynam Rd., Swords, Co. Dublin

LICENCE

19E0287

PLANNING

Fingal Co. Co. Planning Ref. F18A/0163

REPORT AUTHOR
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DATE

1st September 2021

ABBREVIATIONS USED

DAHG	Department of Arts, Heritage and the Gaeltacht
NMI	National Museum of Ireland
NMS	National Monuments Service
OS	Ordnance Survey
RMP	Record of Monuments and Places
NIAH	National Inventory of Architectural Heritage
LAP	Local Area Plan

Table of contents

Appendices:
Appendix A: Grogan, E. 2021 The prehistoric pottery from Mooretown, Co. Dublin (19E0287).
Appendix B: O'Donnell, L. 2021 Charcoal report, Licence No. 19E0287, Mooretown, Swords, Co. Dublin.
Appendix C: Keating, D. 2021 Burnt and unburnt bone from the site of Mooretown, Swords, Co. Dublin (19E0287).
Appendix D: Radiocarbon date certificate UBA-44024.

Acknowledgements:
I would like to thank Will Shanahan and Dudley Filan of ABM Europe Ltd. for facilitating the excavation and for the assistance provided during the works.

Thanks also goes to my excavation team for their hard work during the works, it was greatly appreciated. Thanks also the the specialists that worked on the material from the site, this added greatly to the story of the site.

I would like to thank Antoine Giacometti for his advice and encouragement during the postexcavation process. Thanks also to Brandon Walsh for his work in creating the plans and sections for the report, and to Jose Siles for his work on the stratigraphic report.

Thanks also to Kim Rice for sharing information on the other excavations taking place nearby. With such a density of activity it was greatly appreciated to form a better picture of the surrounding archaeology.

Excavation team:
Steven McGlade (director), Jose Siles (senior supervisor), James McCarthy, Jack Waite & Natasha Keneko (site assistants)

Post-excvavation team and specialists:
Steven McGlade (report writing & production), Muiris Wade (sample processing), Susannah Kelly (conservation), Conor McHale (finds illustration), Eoin Grogan and Helen Roche (prehistoric pottery analysis), Lorna O'Donnell (charcoal analysis), Denise Keating (burnt bone analysis), 14 Chrono Centre, Queen's University Belfast (radiocarbon dating)

Section 1 Introduction

Report summary

A programme of archaeological monitoring and excavation was carried out on the site of a proposed school in Mooretown, Swords, Co. Dublin from April to June 2019. The most significant archaeological feature encountered was a Late Neolithic pit containing the remains of a Grooved Ware vessel. The vessel had been held in place by a number of packing stones. A small quantity of non-diagnostic burnt bone was retrieved from the fill of the pit surrounding the vessel. The pit was radiocarbon dated to the end of the Neolithic period and while there are hints of human presence in the area in the Early Neolithic, this represents the earliest radiocarbon dated feature identified in the vicinity to date.

Based on comparisons with similar features elsewhere, the pit containing the Grooved Ware vessel may be the remains of a votive offering pit, however its truncation make any firm identification impossible.

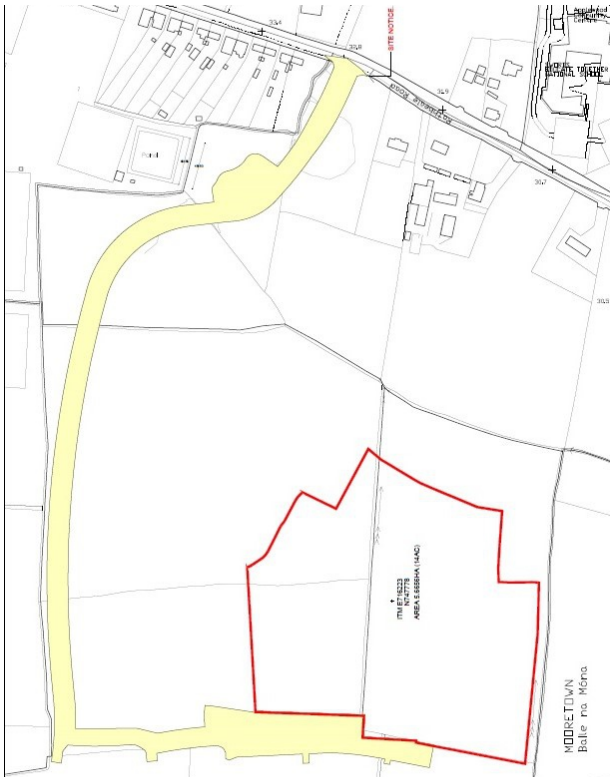
A number of other pits were encountered across the site, which contained quantities of charcoal and small amounts of burnt bone. These may relate to the burial of pyre material and relate to rites associated with cremation, or possibly non-burial related bonfires. A number of fire-pits were also identified nearby, some of which also contained burnt bone. Oak was the only charcoal identified from these fire-pits, which is unusual, and suggests that a specific activity was being carried out in them, possibly related to the nearby Late Neolithic pit.

Close-up plan of the features upcovered during the monitoring programme

View of the remains of the Grooved Ware vessel in pit C2 (top)

Site location in relation to Swords shown on Ordnance Survey Discovery Series mapping (centre)

Site location with north to top (bottom)



The Grooved Ware vessel buried within the pit at Mooretown would have been a special artefact to those that buried it. Its interment may have indicated that the location now held a meaning to the people that had deposited it, and it may well have been marked above ground. Its burial may have been associated with the burning of a body, or offerings on a pyre or pyres, with the activity perhaps being commemorated afterwards. The Mooretown pit may have marked the beginning of the significant activity that took place to the north over the course of the Bronze Age, which was centred around the small tributary of the Broadmeadow River, which it overlooks.

Site location

The proposed school development (the 'site') is situated in Mooretown townland to the west of Swords, Co. Dublin, and south of the Rathbeale Road. It is a green-field site within, but not extending to the boundaries of, three fields separated by agricultural ditches. These fields were numbered 6, 8 and 9 in the testing programme (Frazer 2008).

The site is situated on the north-facing slope of a low ridge of higher ground to the north of the Ward River, on land sloping gently to the north towards a small tributary of the Broadmeadow River. The site is located c.

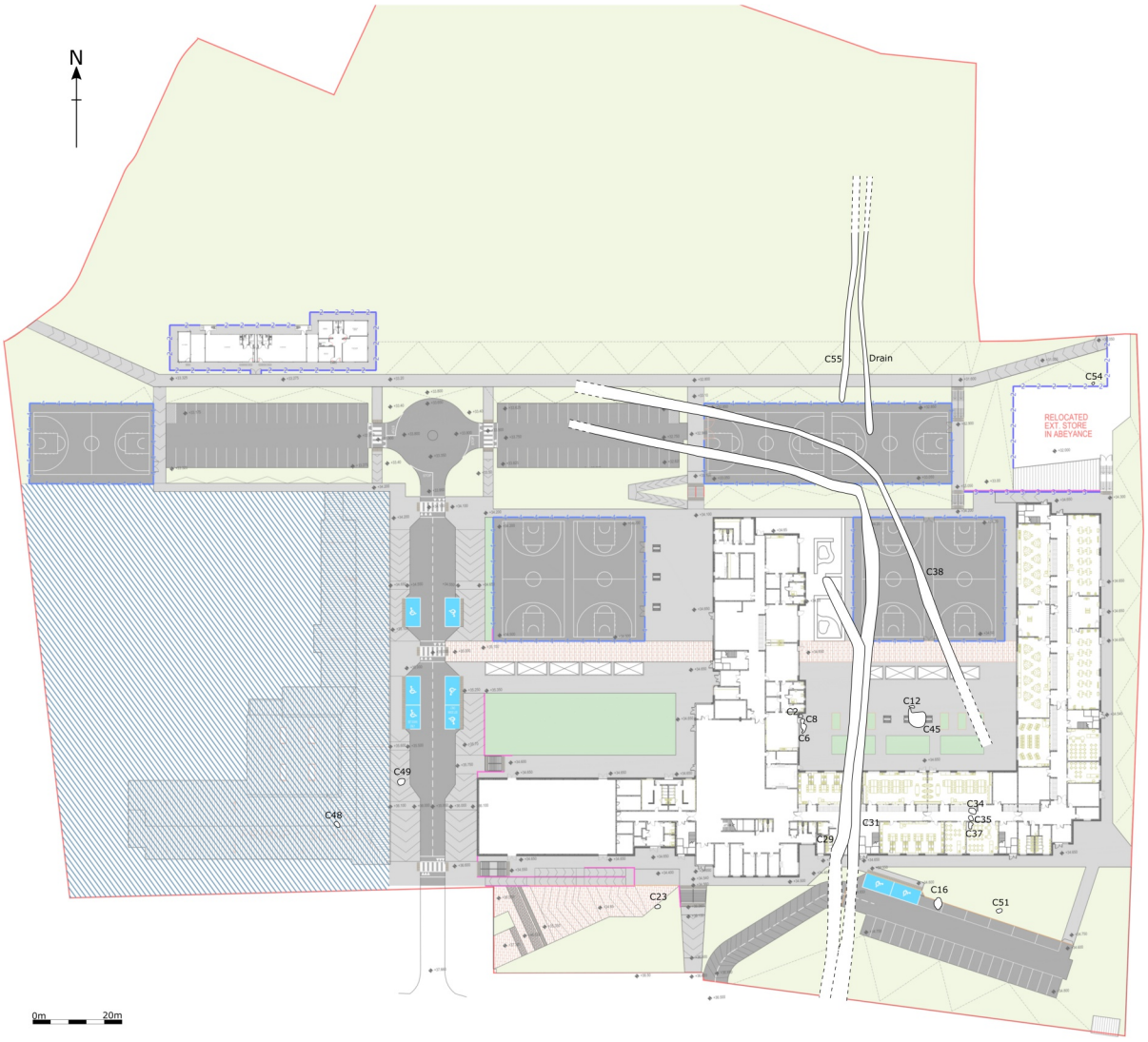
3.5km inland from where the Ward and Broadmeadow Rivers enter the Malahide Estuary and c. 8km from the east coast, within the coastal plain of North Dublin. The site would have had views to the east towards the sea and Lambay Island, and to the north towards the uplands around Naul and Garristown, Co. Dublin. The Broadmeadow River valley to the north is obscured by a low rise in Oldtown townland, while the Ward River valley to the south is also obscured as the ground level continues to rise slightly to the south.

Google Earth image of the site showing the now complete school (top)

Development proposals

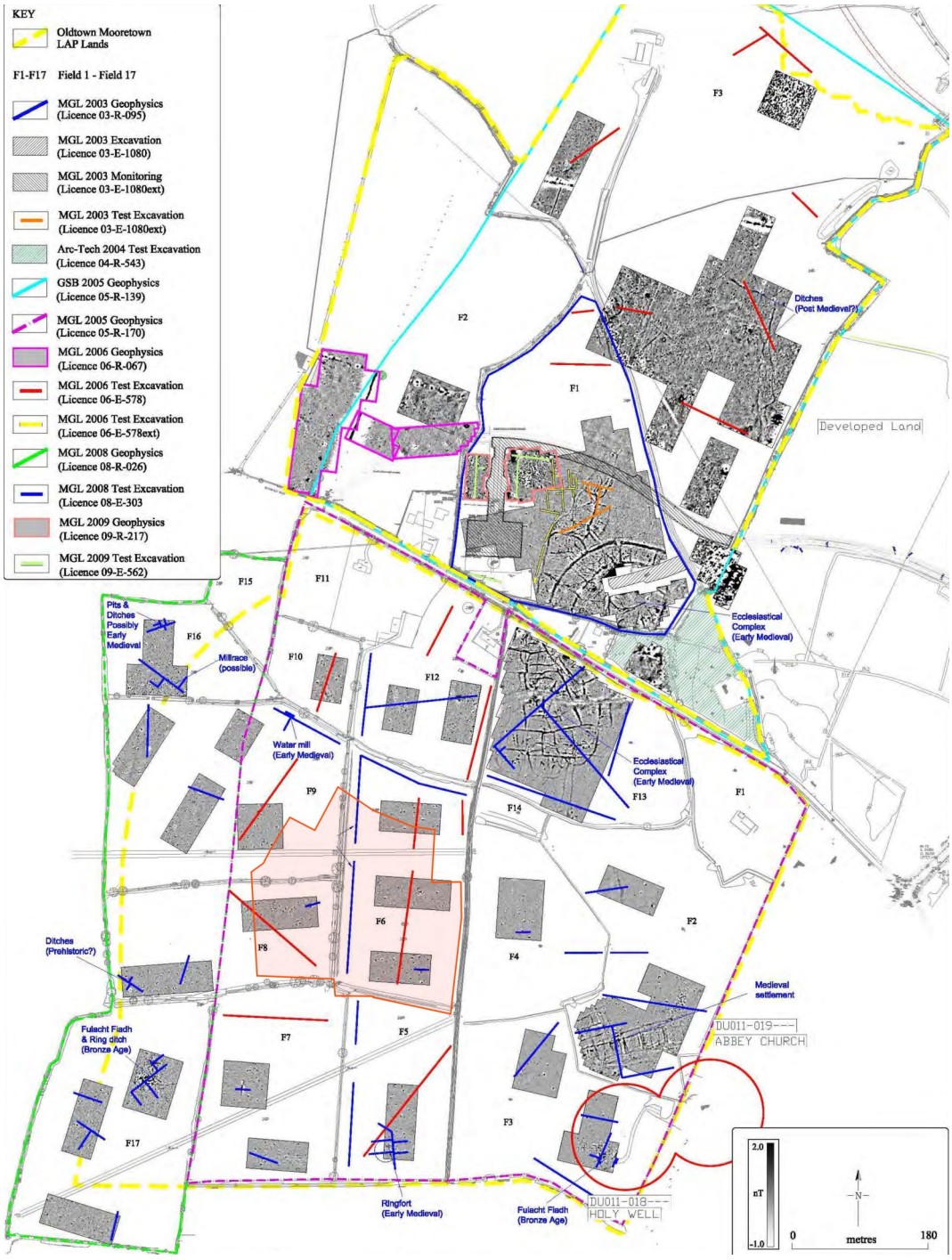
The proposed new school development (Fingal Co. Co. Planning Ref. F18A/0163) relates to the

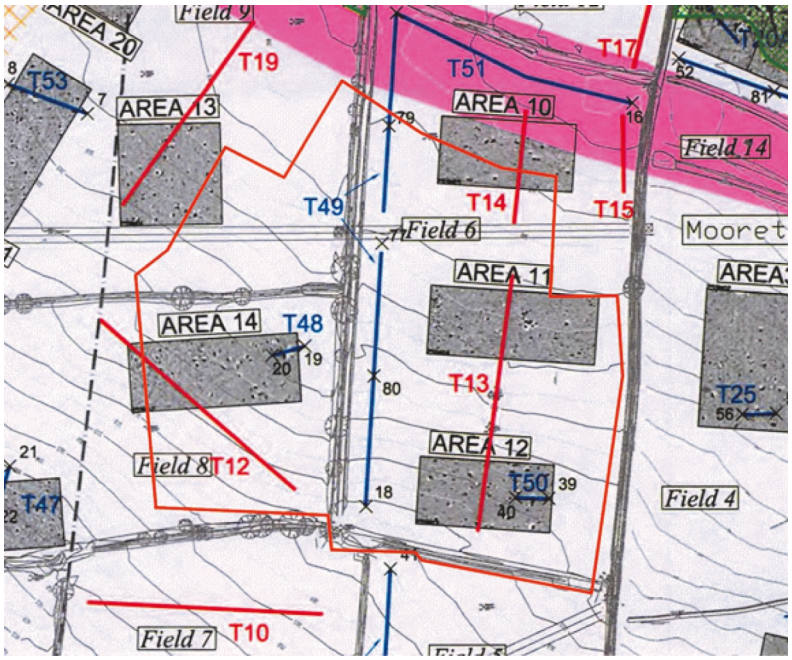
Plan of the school development (bottom)

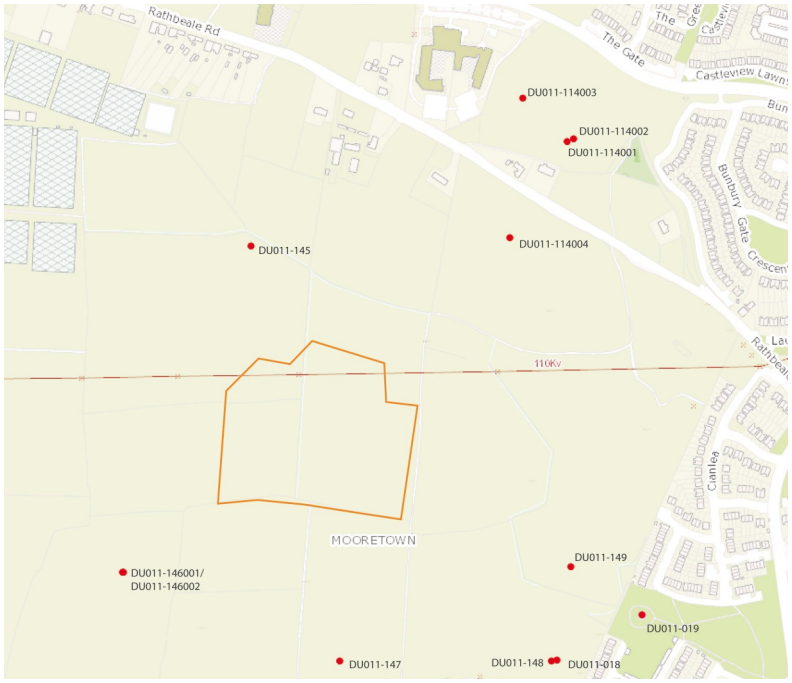


construction of two new school buildings incorporating (A) Swords Community College (RN76475D), consisting of a new post-primary school, (B) a new Primary School and (C) associated site works, including a substation, with just over a hundred car parking spaces, and including landscaping, ball courts and soft play areas. The proposed school development is part of a larger proposed residential development in the area set out in the Local Area Plan 2010.

Summary of archaeological work carried out within the site and surrounding area up to 2010. Original image created by Margaret Gowan & Co. for the Oldtown Mooretown LAP on behalf of Fingal County Council







Close-up image of the previous geophysical surveys and testing programmes carried out within the site (top)

Field numbers used in this and previous reports overlaid on aerial image of the site (centre)

Closest RMPs to the site (bottom)

Archaeological monitoring was required for all groundworks relating to the site in Condition 11 of the Grant of Planning Permission due to the large amount of archaeological activity previously identified within the wider development area.

Previous archaeology on the site

A testing programme was carried out across the site (and surrounding fields) in 2006 (Bolger 2006). Test-trenches 12, 13 and 14 were situated within the site. No archaeological material was found.

A geophysical survey was carried out in 2008 (Thebaudeau 2008). Areas 10, 11, 12, 13 and 14 were within the site. Two possible geophysical anomalies were identified within the site, and were numbered '19/20', and '39/40'.

A second testing programme across the site (and surrounding fields) was carried out in 2008 (Frazer 2008). Test-trenches 48, 49 and 50 were situated within the site. Both geophysical anomalies identified within the site during the geophysical survey were tested and found to be natural features. No archaeological material was found within the site.

An updated archaeological assessment of the site and surrounding fields was subsequently carried out (O'Connor

2017). This identified a possible moated site to the west of the current boundary of the school site. No features relating to the moated site were identified within the school site and no other features of archaeological potential were indicated by the assessment within the site.

Surrounding archaeology

The site is located within the lands covered by the Oldtown Mooretown Local Area Plan (O'Connor et al. 2010; Courtney 2010). The Local Area Plan (LAP) was devised to manage development in and around the site of an extensive early medieval archaeological complex, which is centred c. 400m to the northeast of the site. The LAP includes lands on either side of the Rathbeale Road and encompasses the townlands of Rathbeal, Oldtown and Mooretown. The ecclesiastic site is centred in the southeastern half of Oldtown and extends south across the Rathbeale Road into the northern part of Mooretown (see Baker 2004 and 2010; Halliday 2004; Bolger 2006; Frazer and Eriksson 2008; Rice 2019d). The oval enclosure incorporates three concentric ditches; the largest encompasses a diameter of 200m, the middle enclosure has a diameter of 130m, while the inner ditch, which measures 70m in diameter, encloses a formal burial ground (Baker 2003c and 2010; Baker 2004; Nicholls 2003).

The townlands of Oldtown, Rathbeal and Mooretown have been the subject to a series of archaeological investigations over the past twenty years. These have included field walking and desk-based studies (Jordan 2005; Courtney 2010; Deery 2011, 2015 and 2017; O'Connor 2017, Deery and O'Brien 2018; Crowley 2018), programmes of geophysical survey (Nicholls 2003; Anon 2004; Stephens 2005; Leigh 2006; Thébaudeau 2008; Harrison 2009), archaeological testing (Swan 1999; Halliday 2004; Bolger 2006; Frazer 2007; Frazer and Eriksson 2008; McQuade 2009; Walsh 2010; Moraghan and McLoughlin 2016; McLoughlin 2015 and 2017; Seaver 2017), archaeological monitoring (Baker 2003a, 2003b and 2003c; Byrne 2003; Clancy and McLoughlin 2018; Rice 2018, 2019a and 2019b; Crowley & Rice 2019; and McGlade 2019), as well as archaeological excavation (Rice and Seaver 2018; Rice 2019c; Rice 2019d).

The results of these investigations show that the area in the vicinity of the site was a focus of activity from at least the Neolithic, with peaks of activity in the Bronze Age and again in the early medieval period.

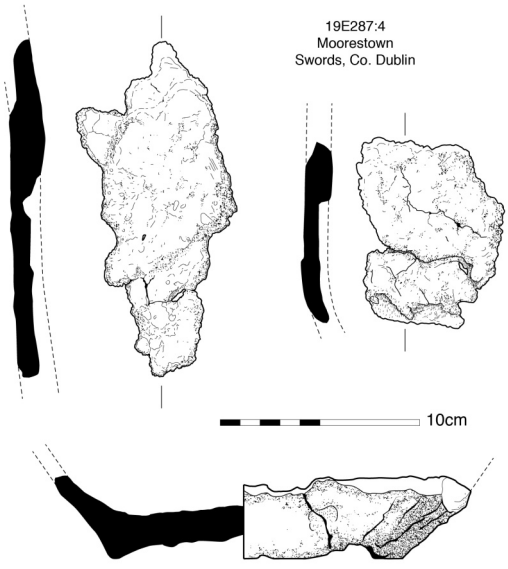
Section 2 Director's findings

The Grooved Ware vessel

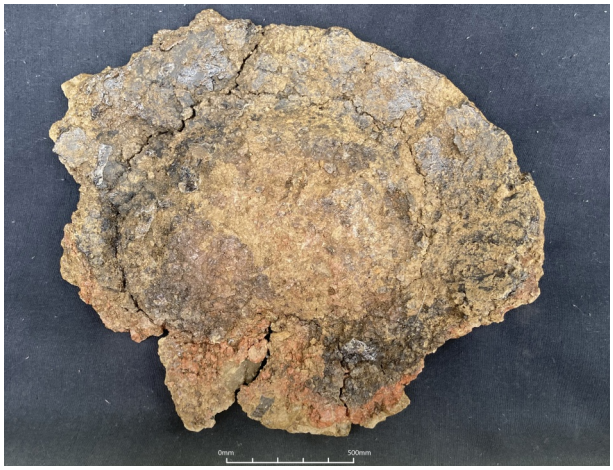
An upright Grooved Ware vessel, deposited in a shallow pit and held in place by a number of packing stones was uncovered towards the southern end of the site at Mooretown. The upper portion of the vessel and much of its contents were lost to ploughing over the years. The remains of the vessel were partially block lifted on site and sent to Susannah Kelly in UCD for conservation (Cons. No. 9307). The base section, which was c. 140mm in external diameter, and two crushed wall sections were stabilised while a further 25 sherds were left untreated for analysis (Kelly 2019).

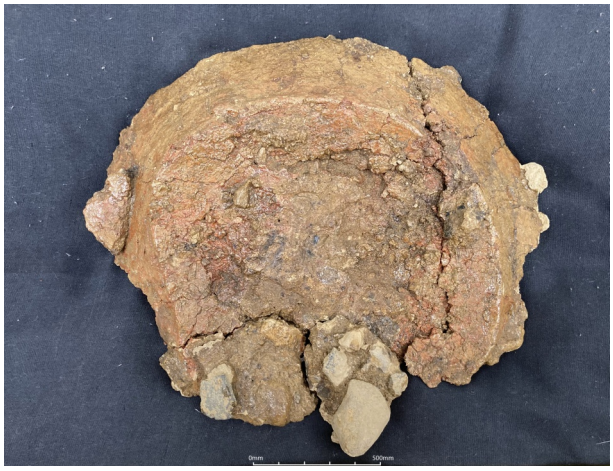
Black accretion on the internal surface of the vessel indicated that it had seen prior use in a domestic context (Grogan & Roche 2021, 1). The analysis of the vessel did not identify any decoration. Decoration may have been present on the truncated upper portion of the vessel, and plain vessels of this type were also common (ibid). Based on the shallow depth of the pit it is likely that the top of the vessel would originally have been close to ground level. It may have been marked or protected by an aboveground feature, such as a small earthen mound or pile of stone. There is ample evidence for the demarcation of Neolithic pits in such a way (Rice 2015, 175).

Illustration of the base and best preserved side sections of the Mooretown Grooved Ware vessel by Conor McHale (bottom left)



View of the top (top right) and bottom (bottom right) of the basal portion of the Mooretown Grooved Ware vessel. Note the black accretion on the internal surface and the lack of burning on the external side of the vessel.





Pre-ex view of pit C2, looking south (top)

Mid-ex views of pit C2 with vessel C4 in situ, looking south (upper and lower centre)

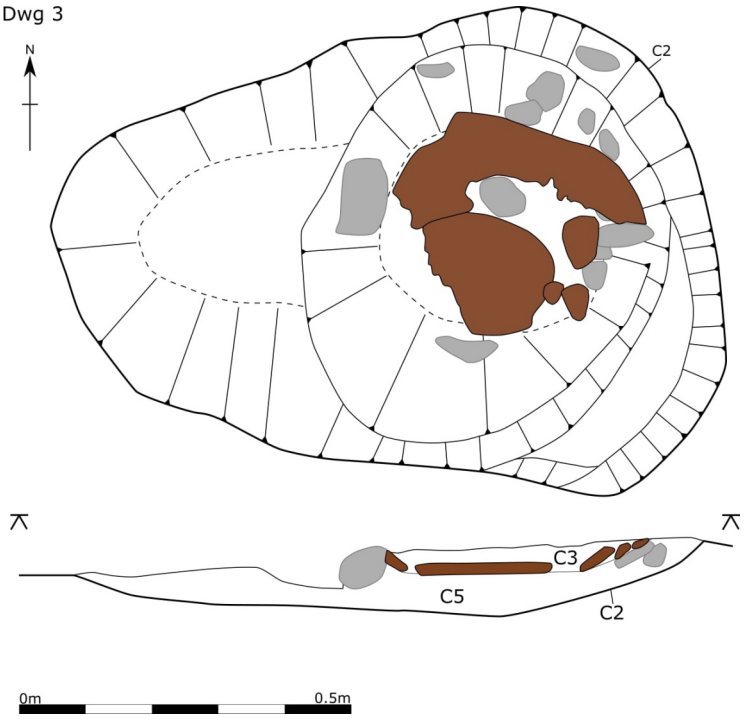
Post ex view of pit C2 with packing stones C57 in situ, looking south (bottom)

The environmental analysis of the fill into which the vessel was set identified oak and low quantities of alder (O'Donnell 2021, 3). A sample of the alder from the pit returned a date of 2573-2463 cal. BC (UBA-44024). The low quantity of the charcoal may be due to truncation, however a number of scenarios may account for the low charcoal content. The charcoal may originally have been within the vessel and was dislodged when the ploughing truncated the pot; or it may have been attached to the exterior of the vessel, incidentally being deposited in the pit; or a handful of the material may have been deposited into the pit prior to the deposition of the vessel itself.

A tiny quantity of burnt bone was retrieved from the fill of the pit into which the vessel was set (Keating 2021, 4). There is a persistent absence of definitive evidence for Late Neolithic human bone from any context in Ireland, with cremated bone fragments recovered frequently being too small for positive identification as human remains (Carlin & Cooney 2017, 49). The burnt bone from the pit at Mooretown conforms to this finding as it was not possible to identify whether the bone was human or animal. The burnt bone may have originated within the truncated vessel, or have been deposited within the packing material around it as part of the rites relating to the deposition of the vessel. The material surviving within the vessel itself was disturbed plough soil with no bone identified.

Grooved Ware is frequently found in ritualised or votive contexts. Some examples of Grooved Ware from probable burial contexts are known, for example at Knowth two possibly upright and intact vessels were associated with human

Dwg 3

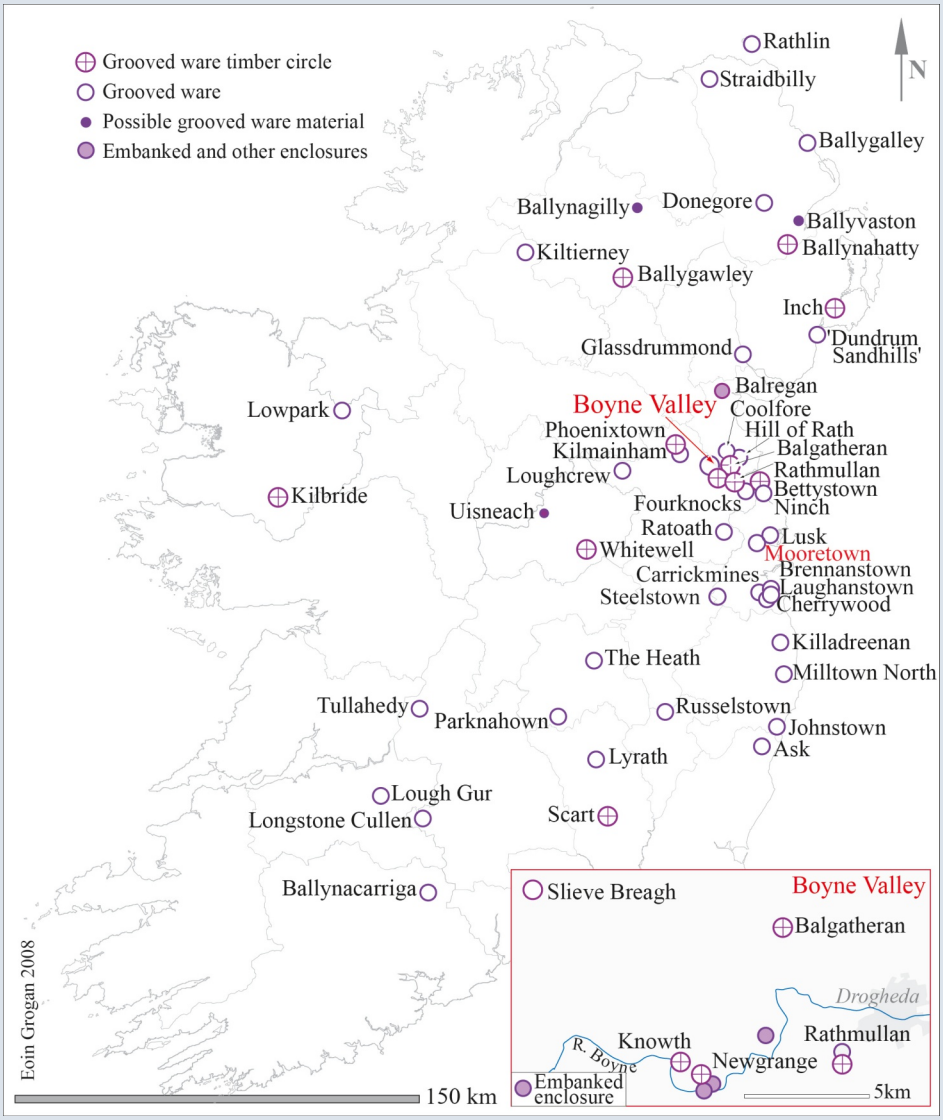


Plan and section of pit C2 with Grooved Ware vessel C4 in situ

remains, possibly as votive offerings (Grogan & Roche 2021, 2). A burial identified at a multi-period cremation cemetery at Kiltierney, Co. Fermanagh comprised a cremation deposit with inclusions of Grooved Ware sherds within a rock-cut pit (Daniells & Williams 1977, 39; Sheridan 2004, 30). The site at Kiltierney, Co. Fermanagh has led to the suggestion that there was some continuity in funerary practice between those using Carrowkeel Ware and Grooved Ware (Sheridan 2004, 30). McSparron (2107, 51) has also suggested the placing of cremated remains within vessels was echoing or continuing Carrowkeel traditions. Grooved Ware pottery was also recovered in association with cremated bone at Fourknocks, Co. Meath (King 1999; Rice 2015, 122).

While the pit may represent the remains of a disturbed cremation other possibilities should be considered. Grooved Ware vessels have been found within pits in other contexts, where they were associated with other artefacts as well as bone. Sherds from at least two Grooved Ware vessels, one of which may have been deposited intact, were retrieved from a pit near Lusk along with flint waste flakes and a small quantity of burnt bone (McCabe 2003, 7). Lusk is situated c. 8.5km to the northeast of the site at Mooretown, to the north of the Rogerstown Estuary and Ballyboghill River. At Rathmullan, Co. Meath a rectangular pit was excavated, which returned a radiocarbon date of 2580-2460BC (Rathmullan 8, Nelis 2011, 6-7). It contained two deliberately placed near-complete Groove Ware vessels set on an irregular arrangement of angular stones, along with additional sherds from different vessels, flint, burnt bone and oak charcoal (ibid.). At least some of the bone identified within the pit was animal. Other nearby pits also contained sherds of Grooved Ware or other late Neolithic artefacts. Further Late Neolithic activity was uncovered at another nearby site, Rathmullan 7, where a pit was found to contain large quantities of Grooved Ware, including a near-complete vessel, as well as worked flint, a rubbing stone and a quern stone fragment (Bolger 2011, 6). Burnt bone from the pit was identified as possible human and pig, while the charcoal was predominantly oak with some quantities of blackthorn/cherry (ibid.). Neither of the pits at Rathmullan were identified as cremation pits, and were suggested to relate to votive offerings (ibid., 25). The pits at Rathmullan were within the hinterland of Lagavooreen 7, where a Late Neolithic timber circle was excavated, which was also associated with Grooved Ware pottery (ibid., 20).

The pit identified at Mooretown conforms with a trend noted in the Late Neolithic data set, where the majority of features, including pits and timber structures date from later in the



Map showing the location of sites where Grooved Ware has been discovered in Ireland (after Grogan 2008 with recent updates by the author)

Grooved Ware

Grooved Ware appears to have originated in northern Scotland c. 3400 cal. BC and emerged in Ireland c. 2900 cal. BC (Ó Drisceoil 2009, 87). It was a relatively short-lived phenomenon in Ireland, ending c. 2500 cal. BC, rapidly being replaced by Beaker pottery in the mid-second millennium BC (ibid.). In Ireland Grooved Ware has been retrieved from a restricted set of contexts, including pits, spreads, timber circles and developed passage tombs (Carlin 2017, 1).

Some have suggested that a mass immigration of people into the country during the Late Neolithic and Early Bronze Age was responsible for the distinctive change in material culture and burial practices of that time (de Valera & Ó Nuailláin 1982; Eogan 1991). Others have suggested that Grooved Ware represents an emerging elite within indigenous Neolithic society, an elite that came to dominance through distinctive social networks and which emphasised its separate identity through the adoption of new forms of material culture, including pottery (Bradley 1990, 69; Cooney & Grogan 1994; Ó Drisceoil 2009, 87). Recent analysis of a variety of archaeological data sources (McLaughlin et al. 2016) suggests that there was a stable population at the time with no evidence for a large incoming group, though this cannot rule out the possibility of conquest as opposed to colonisation. Carlin (2017, 26) has noted that while Grooved Ware probably originated in Orkney, there was no disruption of passage tomb practices associated with its spread and it would appear that the users of both Irish and Orcadian passage tombs played a role in the development of this ceramic and its associated material culture. As such, the arrival of Grooved Ware in Ireland did not mark a large-scale social transformation in Ireland, rather it emphasises the strong connection between the users of passage tombs in these two locations (ibid., 1).

Grooved Ware is relatively rare in Ireland, having been identified on around 50 sites by 2009 (Ó Drisceoil 2009, 87), with that number likely to have increased somewhat over the last decade. There is a dense concentration of sites associated with Grooved Ware to the north in the region of the Boyne Valley with a growing corpus of sites along the east coast.

As previously mentioned, at sherds of at least two Grooved Ware vessels were retrieved from a pit near Lusk, c. 8.5km to the northeast of the site at Mooretown, to the north of the Rogerstown Estuary and Ballyboghill River. Grooved Ware has been retrieved during archaeological excavations of five sites in South Dublin at Carrickmines, Cherrywood, Steelstown, Brennanstown and Laughanstown, however only one of the sites produced a Late Neolithic date (Rice 2015, 122-5). The majority of the sites in South Dublin were found in close proximity to one another to the east in places that were occupied during the Early and Middle Neolithic (ibid., 153).

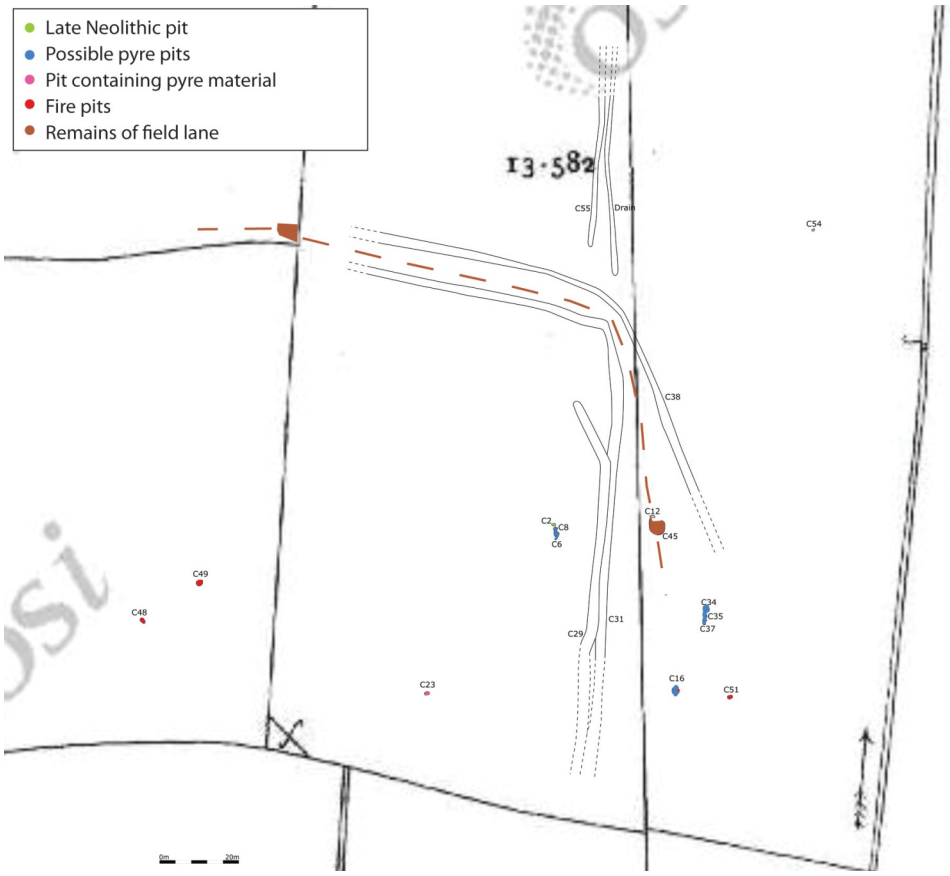
period, c. 2800-2450 BC (Grogan & Roche 2010, 34). This coincides with a shift in ceremonial monuments from passage tombs to circular structures and enclosures around this time, suggesting a period of flux in collective beliefs (Carlin & Cooney 2017, 49). The Mooretown pit also conforms to a trend seen at other Late Neolithic pit sites, where little direct evidence for settlement is identified in the vicinity (Smyth 2014, 117). It could be argued that the fire-pits at Mooretown may imply settlement activity, however this is far from clear.

The careful deposition of the Mooretown pot is mirrored at other Neolithic and Chalcolithic sites, such as the Late Neoloithic Carrowkeel pot containing a cremation burial in the embanked enclosure at Monknewtown, Co. Meath (Grogan & Roche 2021, 2). Later examples such as at Kilmainham, Co. Meath and Newtownbalregan 2, Co. Louth, were not associated with cremated bone, however they presented as single vessels placed upright in individual pits (ibid.). It is possible that the Mooretown pot, while unusual, forms part of an occasional prehistoric votive rite (ibid.).

The Mooretown pit, dates from the end of the period when Grooved Ware was in use and may reflect a votive act in a period of uncertainty or flux. Beaker pottery, which arrives in Ireland around 2450BC, rapidly replaced the use of Grooved Ware (Carlin and Cooney 2017) and arrived with a new set of ideas, and a possible incursion of people. Beaker pottery has been retrieved on a number of nearby sites, one in Mooretown townland itself and others to the south in the vicinity of the Ward River valley and to the north towards the Broadmeadow River valley. Perhaps the deposition of the Grooved Ware vessel was in reaction to this period of uncertainty at the end of the Late Neolithic period as times were changing with the impending arrival of metal.

Other features on the site

A number of other pits were identified in the vicinity of the Late Neolithic pit during the monitoring programme. These were mainly located in an east-west orientated strip of ground measuring c. 155m by 50m towards the southern end of the site.



Location of the features identified during the monitoring programme. The oblong possible pyre pits are highlighted in blue and the pit containing possible pyre material is highlighted in pink

Features relating to cremation activity?

Three oblong features with indistinct fills were identified, all sharing the same orientation. They were all 2.5-4m in length and over 1m in width. They had no obvious function and were initially interpreted as possible waste pits. No scorching was apparent within any of the pits, so they were not used as fire-pits, however each pit had at least one charcoal-rich fill. In all cases the predominant charcoal present was oak (O'Donnell 2021, 3).

Two adjacent cuts (C6 and C8) were located 1m south of the Late Neolithic pit and appear to have been parts of a larger irregular pit. They were orientated approximately north-south and were shallow and poorly defined. A spread of charcoal was present at the edge of the pit suggesting the area around the pits was reduced when the feature was in use. As with the other pits only oak charcoal was present within the pits.

Context No.	Length	Width	Depth
C6/8	2.56m	1.24m	0.4m max
C16	2.5m	1.2-1.9m	0.38m
C33/34/35/37	4m	1.05m max	0.25m

Another pit (C16) was oblong in shape and poorly defined, and orientated north-south. Again, there was no evidence for in situ burning within the pit and only oak charcoal was present (O'Donnell 2021, 3). The similarity in orientation, definition and general dimensions between these features is notable, perhaps implying they shared a similar function. The analysis of the burnt bone from pit C16 identified part of an unburnt mandible, which appeared gracile, however it was not possible to identify as human with certainty (Keating 2021, 5-6). Additional fragments of burnt bone were also retrieved from the same fill, however it was not possible to identify the species (ibid.). Some of the burnt bone was only charred rather than calcinated, suggestive of lower temperatures in parts of the fire burning the bone (ibid.).

A cluster of features (C33, C34, C35 and C37) to the southeast of the Late Neolithic pit may also relate to a similar activity. This feature survived as two patches of scorched natural

Mid-ex view of pits C6 and C8, looking east (top)

Mid-ex view of pit C49, looking east (centre)

Mid-ex view of pit C35, looking south (bottom)

(C33 and C37) with a shallow pit (C35) and a spread of charcoal (C34) in between. The features were orientated north-south. Unlike the two other features in situ burning survived here, with the base of the pit also scorched, however no burnt bone was identified within the fills.

It is possible that these features relate to cremation pyre pits, with the pits functioning as a shallow cut beneath the pyre itself to aid combustion. The presence of possible human bone in the latter, along with a number of fragments of burnt bone would appear to imply its association with burial, or the processing of human remains in some way. While in situ burning was not noted at either pit a certain level of disturbance may have taken place after the burning event and during the process of sifting through the ashes for the cremated bone. Oak was the only charcoal identified from either feature and was the preferred fuel for cremation at this time (O'Donnell 2021).

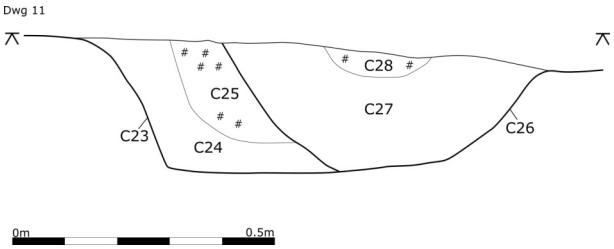
There is a persistent absence of definitive evidence for Late Neolithic human bone from any context in Ireland, with cremated bone fragments recovered frequently being too small for positive identification as human remains (Carlin & Cooney 2017, 49). As noted above, burnt bone of both human and animal origin has been identified from Late Neolithic pits elsewhere, interpreted as votive offerings, and it is possible that a pyre here was used to burn animal offerings as well as, or instead of human remains.

Although cremation as a burial rite in prehistoric Ireland is well-documented, the pyres upon which cremations were burnt are less frequently identified within the archaeological record (Cooney 2017, 120). This is likely to be because they left little sub-surface trace and were largely above-ground constructions. Criteria have been suggested for the identification of pyre features archaeologically. Arcini (2005, 70-1, cited in Geber 2009, 222) defines them as sometimes only 'slightly discoloured sooty patches, oval or round in shape with a diameter of about 0.5m' in which possibly some burnt bone might be found. McKinley (1997) adds that some evidence for in situ burning must be present for the feature to be interpreted as a pyre.

Pyre sites have been infrequently recognised, which makes comparison challenging. A similarly proportioned sub-oval pit measuring 3.6m by 1m with in-situ burning on its base was excavated at Readsland, Co. Meath, which was interpreted as a pyre or receptacle for pyre material (McGlade 2020, 302-3). The charcoal present within the pit was oak (L. O'Donnell pers. comm. 2021) and a large hollow scraper were retrieved from the pit, which suggests a Late Neolithic date. Some of the bone, which was both burnt and unburnt, was identified as animal (J. Geber pers. comm. 2021) and it is unclear whether the feature does represent a pyre, however there are similarities with the pits at Mooretown.

Waddell (1998, 156) notes that at Cloghskelt, Co. Down a thick black deposit interpreted as the remains of a pyre containing minute fragments of burnt bone was uncovered in the vicinity of a flat cemetery. In other cases, the pyre was preserved by subsequently being covered, such as at Carrowbeg North, Co. Galway which survived beneath a barrow mound (Willmot 1939, cited in Cooney 2017, 120). In some cases a shallow pit may have been dug beneath the pyre to aid with combustion, such as at Templenoe in Co. Tipperary, where anumber were interpreted as possible pyres within a Middle Bronze Age cemetery site (Geber 2009, 223). Two large, shallow pits adjacent to burial monuments were uncovered during excavations in Kilgobbin, Co. Dublin and were interpreted as pyre pits (McGlade 2018, 30). At Rockfield, Co. Kerry, a Late Bronze Age/Early Iron Age pit with two channels cut into the base with evidence for intensive scorching was interpreted as a crematorium or pyre (Collin 2003). Becker (2004, 15) has argued that some sites previously interpreted as burial sites with token quantities of cremated bone should be reinterpreted as pyre sites.

Another suggestion is that the pits may have served as receptacles for pyre-related material. Some Bronze Age sites have produced evidence for complex interactions with cremated remains (Lynch & O'Donnell 2007, 116) demonstrating practices that were not exclusively, or perhaps even primarily, related to burial. Becker (2014, 14-15) argues that some of these deposits can



East-facing section of pits C23 and C26 (top left)

Mid-ex view of fie-pit C51, looking south (top right)

Mid-ex view of fire-pit C49, looking east (bottom right)

be understood as secondary deposits of pyre material, and that the sites where these deposits are found represent ritual precincts, or stages, rather than burial grounds. O'Donnell (2016, 169) has suggested that there may have been a practice of picking through pyre material to remove the bone in order to bury the pyre material itself. As such, a paucity of burnt bone in some cremation-related deposits could be viewed as intentional and meaningful, rather than anomalous (Keating 2021, 8).

One of the pits (C23) excavated at Mooretown was truncated by a later recut (C26), with the same sequence of a sterile basal fill followed by a charcoal-rich upper fill seen in both pits. These regularly shaped intercutting pits were different in form to the other features and had no in situ burning. The repeated sequence of fills and similarity between the pits suggests an intentional act was recurring in this location. A small quantity of burnt bone was retrieved from the earlier of the pits (C23), however it was not possible to identify the species of the bone (Keating 2021, 7). The charcoal from the fill of the earlier pit was identified as predominantly oak, with low quantities of ash, alder and hazel (O'Donnell 2021, 3). Both oak and low quantities of alder were also identified within the Late Neolithic pit, perhaps implying a connection between the features. The repetition of similar actions in Pit C23 and its subsequent recut C26 may be an example of the burial of pyre-related material.

Fire-pits

Four fire-pits (C21, C48, C49 and C51) were excavated to the southwest and southeast of the Late Neolithic pit. One of these survived as a patch of scorching on the subsoil having been removed by ploughing over the years. The fire-pits were sub-circular or oval in plan, with two located c. 90-100m to the southwest and two c. 50-60m to the southeast of the Late Neolithic pit. The southwestern fire-pits were oval in plan, with one having largely been ploughed out. One of the southeastern fire-pits (C21) was cut into the fill of one of the oblong pits (C16), suggesting some of the fire-pits at least were part of a later phase of activity.

Environmental analysis of the charcoal from two of the fire-pits indicated that only oak charcoal was present within the pits (O'Donnell 2021, 2). This suggests a deliberate selection of oak as the fuel for the fires, which is unusual. Oak, which has good burning properties, was the preferred wood for cremation, as well as being used for construction at the time. It later became the predominant wood used in metal manufacture. Burning it in a fire would appear wasteful unless the wood was no longer useful

or it was serving a specific purpose. This may imply that there was a bountiful supply of oak available in the surrounding area, or that the oak related to a specific activity being carried out at the site. Charcoal and pollen data from North, West and South Dublin indicates that there was significant woodland clearance in the Dublin area by the Early Bronze Age (ibid., 4). This suggests that oak was sought out for use within the fires, implying the type of wood selected had a significance.

Without additional dating it is impossible to say whether the fire-pits are broadly contemporary with the Late Neolithic pit, however it is possible they represent commemorative activity within a ritualised landscape, which was returned to repeatedly with oak fires lit.

Later features encountered

Just over 20m to the east of the Late Neolithic pit a sub-rectangular metalled surface was uncovered. A band of larger stones was present along the western side, which protruded beyond the rest of the surface at one end and curved slightly at the other. A small charcoal-filled pit was located to the north of the surface, which may be related. The purpose of the surface was unclear. It may have been the floor of a lightweight structure or a working surface. There was no indication of associated uprights to suggest a structure and the surface was sitting directly on the natural subsoil. A second metalled surface was identified further to the north during the monitoring programme between two of the post-medieval field boundary ditches and truncated by one of the existing field boundaries. Based on the location of the surface between the two field boundaries it was interpreted as the remains of a field access lane, possibly at a soft point in the field. It is possible the metalled surface east of the Late Neolithic pit is also part of this post-medieval agricultural landscape.

A small spread of burnt stone was uncovered 3m to the northeast. Initially it was thought that this may be the truncated remains of a burnt spread, however a sample taken from the spread produced no charcoal and there is no way of knowing how the stone was burnt.

Mid-ex view of metalled surface top east of Late Neolithic pit, looking north (top)

Mid-ex view of metalled surface to northeast. These surfaces are likely to be surviving sections of relict field lanes within the site and align with the post-medieval field system (bottom)

A charcoal spread was also uncovered to the northeast, which may be related, though it was isolated from the other features. Later post-medieval ditches relating to drainage and field boundaries were also identified and there was evidence of severe truncation of the archaeology through ploughing and agricultural activity in the past.

Prehistoric archaeology in the surrounding area

Few upstanding monuments attest to a prehistoric presence in north Co. Dublin, a result of a long tradition of arable farming on its fertile lands from medieval times (Stout & Stout 1992, 7). However, the use of aerial and satellite imagery combined with an increase in archaeological investigation in recent years has seen a rise in the identification of prehistoric archaeology in the area. A number of monuments of prehistoric date are now known in the vicinity.

There are strong indications that the presence of people in Ireland during the Neolithic was widespread (Cooney 2000, 23). The earliest archaeological evidence in the vicinity of the Study Area dates to the Early Neolithic period, with sherds of Early Neolithic carinated bowl being identified within a pit in Oldtown to the north of the site (Grogan and Roche 2019, 2). The pit also contained later sherds of Beaker pottery suggesting the earlier pottery may be ex situ (Rice 2019c), however it does suggest that people were present in the vicinity from the Early Neolithic. Further afield, two probable Early Neolithic houses (DU012-079---) were excavated at Lissenhall Little to the northeast of Swords on the south-facing slopes of the Broadmeadow River valley, with later activity suggested by the associated flint assemblage (Reilly 2004, 12). An Early Neolithic occupation site was also identified at Feltrim Hill, to the southeast of Swords, where numerous artefacts were retrieved along with Early Neolithic pottery and a fragment of porcellinite axe

Map showing the main rivers and streams in Dublin and their relationship with the sites where Grooved Ware has been retrieved in Dublin. The other Neolithic sites in the vicinity of the site mentioned in the text are also labelled along with other nearby sites that may be contemporary

(Hartnett & Eogan 1964, 17). An Early Neolithic house was also uncovered at Rogerstown to the northeast near Lusk. In the Early Neolithic there was a strong pattern of settlement along rivers, and frequently in places relatively close to the coast (Smyth 2014, 134-5). The coastal zone provided rich raw materials and food resources, and after period of clearance, could lead to fertile and easily navigable river valleys (ibid.).

The Neolithic period is renowned for its megalithic tombs, however only two are known from the greater vicinity, a portal tomb at Howth and a passage tomb at Rush, both of which are along the coast. A number of cairns and middens have also been identified along the coast of North Dublin and may date to the Neolithic period. Burial mounds were also components of the prehistoric landscape and a number are known from North Dublin. Many of these have not been investigated archaeologically however, and it is difficult to assign them to a specific period. There are indications that the closest mound to the site at Knocksedan may be more recent in date. There are 17th century references to bones being disturbed from the mound during nearby quarrying activities and one particular reference records the discovery of a very large skeleton, reported as being 8 foot 4 inches in height, and orientated north-south (Ware 1705). While the height of the individual appears exaggerated, the burial described suggests an extended inhumation of a tall individual. The orientation suggests a pagan burial practice, which is further implied by its presence in a mound. Extended inhumation is not a common burial tradition in prehistoric Ireland (Collins 2001, 31), though some examples are known. Norse pagan burials have been associated with a north-south orientation (Shetelig 1912, 230), though a mixed orientation has been noted elsewhere in Irish and Scottish Viking graves (Shetelig 1945, 37). It is possible, given the inferred size of the individual and the orientation that the burial may be that of a Viking, and Ware (1705) suggested the site was a 'valcoster burial', a practice associated with the Vikings, which involved the laying of the dead from a battle in a heap and covering them with a large mound of earth. The reference to Viking raids on the monastery of Swords, and the subsequent indications that the monastery, and indeed the surrounding territory, had come under the control of Viking Dublin would not preclude this possibility. While it is possible the burial may relate to later interment within an earlier prehistoric burial monument, it remains unclear whether the mound at Knocksedan formed part of the prehistoric landscape in the vicinity of the Mooretown pit.

There are no other Late Neolithic sites known from the immediate vicinity of Mooretown, though a number of sites in the vicinity have produced sherds of Beaker pottery dating to the transitional period from the Late Neolithic to the Early Bronze Age. Beaker pottery was retrieved from a pit in Mooretown townland c. 175m north of the site, and was associated with burnt bone and lithics (Rice 2019b). The pit contained sherds of pottery rather than a complete vessel, with burnt and unburnt bone identified in the fill (ibid.). This may represent a continuation of the votive or burial-related activity demonstrated at the Mooretown Late Neolithic pit. As previously mentioned, Beaker pottery was also retrieved from a pit in Oldtown. A pit excavated in Rathingle to the south of the Ward River, contained sherds of Beaker pottery along with burnt bone, again indicating continued activity in the area in the period immediately after the Mooretown pit (McGlade, forthcoming). This marked the beginning of a significant increase in activity in the surrounding area, with Bronze Age and later Iron Age settlement and burial monuments identified in Mooretown, Oldtown and Rathbeal townlands to the north and at Windmill Lands and Rathingle to the south.

The finds of two stone axes in the vicinity of Swords, one to the south of the Ward River at Forsterstown (NMI Ref. 1959:13) and a second found during excavations to the north at Windmill Lands are physical reminders of the woodland clearance that was carried out during this period, while two flat bronze axeheads (Museum Reg. 1939:16 and E92:335) indicate this land clearance was still being carried out in the Bronze Age. This creation of cleared land was a significant impact and would have defined key areas for future settlement and agriculture, moulding how future generations would see and use the landscape.

Late Neolithic activity in North Dublin

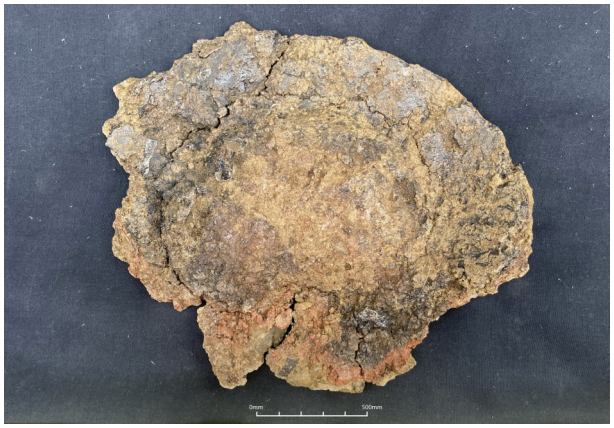
A number of additional sites have been radiocarbon dated to the Late Neolithic period in North Dublin. One of two pits uncovered at a major lithic scatter site identified at Robswalls, near Malahide returned a radiocarbon date of 2885-2593BC, broadly contemporary with the Mooretown pit (Keeling & Keeley 1994; Cooney 2000, 210; Chapple 2019). The pit contained 545 artefacts, including a porcellanite axe that would have originated from quarries on the Antrim Coast, and has been interpreted as a deliberately deposited hoard (Cooney 2000, 210). At Coldwinters 5, to the north of the site along the Ballyboghill River valley, a fulacht fiadh trough returned a radiocarbon date of 2619-2465BC, contemporary with the pit at Mooretown (Chapple 2019, Campbell 2002, 3). Two irregular pits were uncovered at Richardstown 15 in the vicinity of the Ballyboghill River and its tributaries, one of which returned a date of 2836-2298BC, again contemporary with the Mooretown pit (Chapple 2019, Campbell 2004, 3). No other artefacts were identified within the pits at Richardstown, however there are comparisons to be made with the possible pyre pits at Mooretown, which were also somewhat irregular in shape and had charcoal-rich deposits yet no in situ burning. The radiocarbon dated pit at Richardstown presents as an oblong pit orientated northwest-southeast c. 2.5m in length, 1.3m in width and 0.28m in depth (Campbell 2004), broadly comparable with the pits at Mooretown. Slightly later radiocarbon dates of 2459-2136BC were returned for Ballough 23, near the Ballough Stream, a tributary of the Ballyboghill River, where a possible roasting pit using hot stone technology was identified along with a pit, post- and stake-hole complex (Chapple 2019; Chapple 2002).

At Kilshane 5, to the west of the site, a segmented enclosure dating to the Middle Neolithic was excavated that had evidence for reuse dating to 2459-2033BC (Chapple 2019; Moore 2009, 51). The period of reuse at Kilshane consisted of midden deposits and burial activity that continued into the Bronze Age, with ceramics including Beaker and later Early and Middle Bronze Age forms identified (Moore 2009, 86). Another fulacht fiadh site at Ward Lower, to the east of the site, returned a date of 2469-2041BC, again slightly later than the pit in Mooretown (Chapple 2019; Schweitzer 2008, 15). Interestingly, the site at Ward Lower is close to the Ward River, while the site at Kilshane is close to one of its tributaries. Grooved Ware has also been recovered from a site in Ratoath, Co. Meath, which is along the Broadmeadow River. A polished stone axe (NMI Reg. No. IA/234/64) retrieved from Corrstown in the vicinity of the Ward River is a further indication of Neolithic activity along the river. This is reflected elsewhere in the Irish Neolithic, where river valleys had a significant draw in the siting of monuments, notably along the Boyne Valley to the north, but also evident along smaller rivers and streams elsewhere in the county, such as South Dublin (Rice 2015, 81).

These sites indicate a range of activities taking place in the North Dublin area during the Late Neolithic period, and perhaps highlights the importance of the rivers and streams in the area to these Neolithic communities. The presence of river valleys, fertile ground and the relative proximity to coastal margins would have all made the Swords area an attractive prospect in prehistory. The archaeological evidence evokes a well-occupied prehistoric landscape surrounding the Ward and Broadmeadow River valleys from the Neolithic period, with both monumental burial and more discrete urn burial taking place in the vicinity in the Bronze Age, and evidence for settlement and cultivation from the Late Bronze Age and Iron Age.

Section 3 Conclusion

While there are hints of human presence in the area in the Early Neolithic, the Late Neolithic pit at Mooretown represents the earliest radiocarbon dated feature identified in the vicinity to date. The Grooved Ware pot carefully placed within the pit is an unusual find with only a few parallels known to date. Interestingly, one of the other examples of near-complete Grooved Ware vessels deposited within a pit comes from Lusk, which is c. 8.5km away. By the later Neolithic period, after a period of land clearance earlier in the Neolithic, river valleys would have offered fertile soils and easily navigable route-ways. Both sites are located in the vicinity of river systems, likely to have attracted the communities that created them.



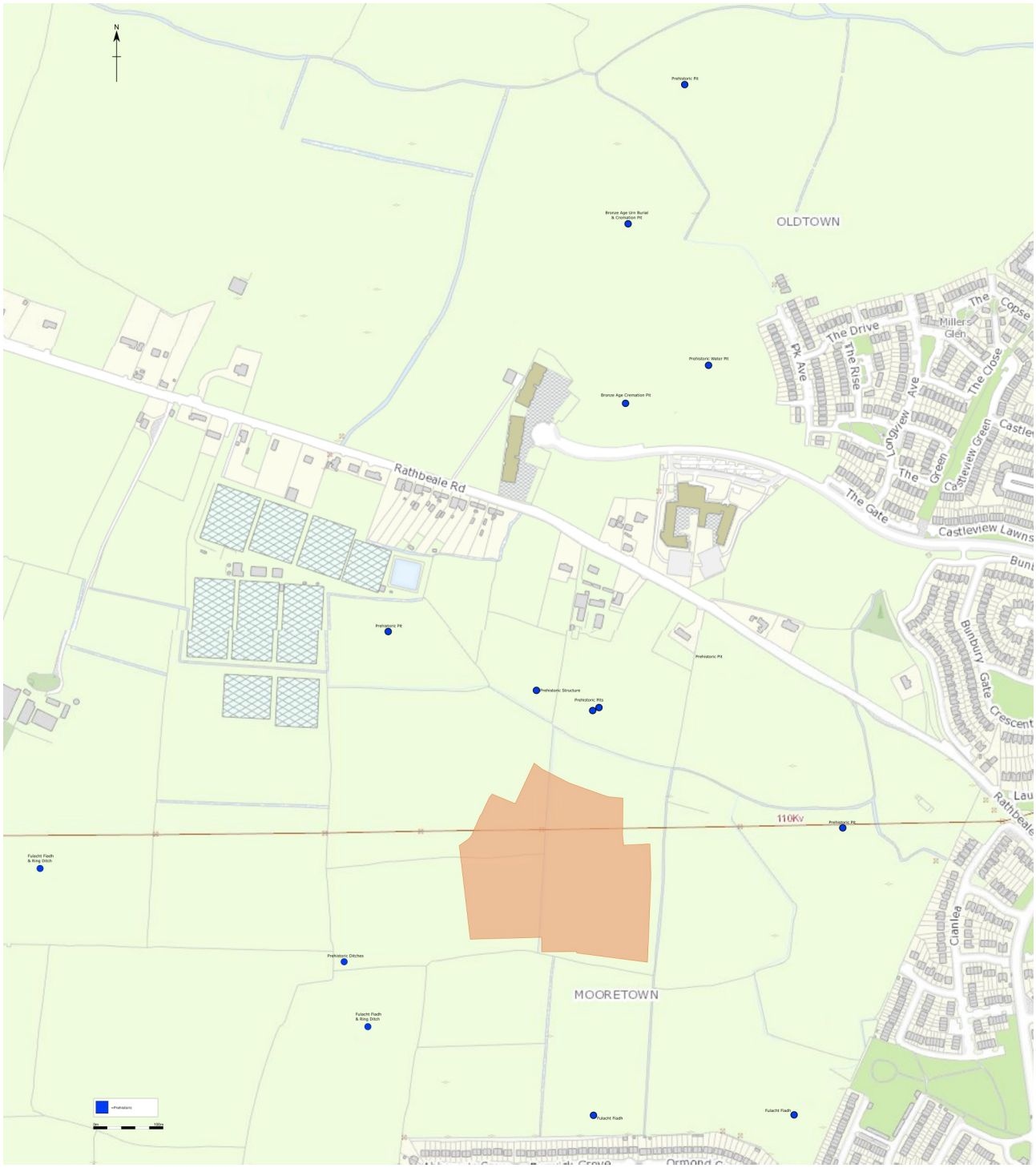
The Late Neolithic pit at Mooretown was heavily truncated, which makes categorising it somewhat difficult. While some burnt bone was present within the fill around the pot, none was identifiable as human. It is also unknown whether the vessel contained any human remains. Based on comparisons with other pits containing Grooved Ware vessels, and the fact that the vessel was deposited intact or largely intact, it is likely the pit represents a votive offering pit. Other examples of these contain quantities of burnt bone, usually non-diagnostic, though occasionally identified as animal or human. They frequently contain additional artefacts, however a lack of additional artefacts within the pit at Mooretown may be due to the severe truncation of the pit.

A number of pits were identified in the vicinity of the Late Neolithic pit at Mooretown that may be related. Three oblong features may be the remains of pyre sites and were associated with oak charcoal layers. A nearby recut pit had repeated phases of deposition and may have been a repository for pyre-related material. Four fire-pits were also uncovered, which again used oak as fuel. The proximity of the features to the Late Neolithic votive offering pit, combined with a similarity in the oak charcoal and fragmentary bone content of the features suggest they are linked, possibly related to the votive activity associated with the deposition of the pot, or to later commemorative activity. The Grooved Ware vessel buried within the pit at Mooretown would have been a special artefact to those that buried it. Its interment may have

Mid-ex view of the Grooved Ware vessel uncovered at Mooretown (top)

Post-conservation view of the base of the vessel uncovered at Mooretown (bottom)

indicated that the location now held a meaning to the people that had deposited it, and it may well have been marked above ground. Its burial may have been associated with the burning of a body, or offerings on a pyre or pyres, with the activity perhaps being commemorated afterwards. The Mooretown pit may have marked the beginning of the significant activity that took place to the north over the course of the Bronze Age, which was centred around the small tributary of the Broadmeadow River, which it overlooks.



Other prehistoric features in the vicinity of the site at Mooretown

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THE PREHISTORIC POTTERY FROM MOORETOWN, CO. DUBLIN (19E0287)

Eoin Grogan and Helen Roche

Mooretown
January 2021

for Archaeology Plan Ltd

The prehistoric pottery from Mooretown, Co. Dublin (19E0287)

Eoin Grogan and Helen Roche

The site at Mooretown produced the partly intact base of an upright Grooved Ware vessel. This is an unusual and important discovery that increases our understanding of late Neolithic votive actions and highlights the coastal distribution of contemporary settlement in north Leinster.

Location and context

The site is on level coastal terrain drained by the Broadmeadow and Ward Rivers. The prehistoric pottery came from a single context, the fill of a much-truncated pit (McGlade 2019).

The Grooved Ware vessel

Only the truncated and flattened base and lower part of the pot were recovered. The vessel stood upright in possibly isolated pit and was carefully cradled with packing stones (McGlade 2019, 10–12, dwgs 2–3, pls page 11). While this is clearly a special deposit there was no (surviving) trace of associated funerary evidence.

This is a fine, thin-walled vessel, of evenly fired red- to brown-buff fabric with a dark grey inner core and internal surface. The exterior is very smooth and was finished with a thin slurry (a fine, inclusion-free wash or paste). A thick, blackened accretion occurs over much of the internal surface indicating that it had, as is very common, seen prior use in a domestic context.

The absence of any rimsherds makes a positive identification of ceramic type difficult. The pot has features (general shape, dual tone section, thin walls) that are certainly present in some late Bronze Age pots. Nevertheless, the very fine, very thin, fabric, the sharply defined baseangle, the comparatively low content of smaller inclusions, and the accompanying radiocarbon date (2573–2463 BC, Steve McGlade pers comm.) suggest that this is a (possibly plain) late Neolithic Grooved Ware vessel. Pots such as this tend to have simple rims—rounded or flat-topped. The overall profiles tend to be bucket-shaped or slightly barrel-shaped. The diameter of the base (*c*. 140mm) suggests a small to medium-sized vessel. While decoration—in the form of distinct grooves is a feature of this type (most frequently a single line immediately beneath the rim on the interior)—plain vessels are also common. Good general parallels occur on well dated sites at, for example, Knowth, Co. Meath (Eogan and Roche 1997; Roche and Eogan 2001).

Knowth also produced two possible burials amongst the very rare Irish Grooved Ware examples. These are from satellite sites (Nos 6 and 18) in the passage tomb cemetery (Eogan and Roche 1997, 211–12, figs 47–48). In site 6 sherds from a large, fine, highly decorated vessel were possibly

associated with a cremation (not identified) in the right-hand recess; the vessel was probably positioned upright and intact. At site 18 the deposit consisted of sherds of another fine, decorated vessel with part of a human skull (neither identified) and 'pieces of flint' including a scraper; while the evidence is less clear-cut this too may have been upright and intact[1]. While she was sceptical about the funerary context of the discoveries Sheridan (2004, 28, 31) acknowledged their probable votive function. Sheridan (2004, 30) also published details of the example at Kiltierney, Deerpark, Co. Fermanagh (still, it appears, the only definite Grooved Ware associated burial in Ireland). Although, more recently, a considerable number of Grooved Ware sites have been excavated there are no further clear-cut burial associations and the majority of finds come from ritual, including Knowth, Lagavooren and Bettystown, Co. Meath, or very occasionally domestic, contexts such as Slieve Breagh, Co. Meath (Grogan and Roche 2012; Eogan, J. 1999; Grogan 2004, 111, fig. 9.4).

The careful deposition of the Mooretown pot is mirrored not only by the Knowth examples but also by other Neolithic and Chalcolithic vessels such as the Carrowkeel pot containing a cremation in the embanked enclosure of Monknewtown (Sweetman 1976). This, as Sheridan (2004, 31) points out, should date to the late Neolithic. Later—Chalcolithic—deposits, at Kilmainham, Co. Meath (a fine domestic pot), and Newtownbalregan 2, Co. Louth (a polypod bowl), also consisted of single vessels placed upright in individual pits without evidence for associated human remains (Grogan and Roche 2011g; 2009c). It appears, therefore, while unusual, the Mooretown vessels represents part of an occasional prehistoric votive rite.

Regional context

Mooretown is a very important addition to the cluster of small-scale late Neolithic sites in the mid-Leinster area (Grogan and Roche 2010a, illus. 6). although, apart from a small assemblage at Lusk, Co. Dublin (Grogan and Roche 2009a), this is the first reported discovery in the immediate area. In County Kildare there are examples at Bishopsland, Steelstown, Bray Upper and Russellstown (Grogan and Roche 2014; 2010b; 2009b; MacSween 2009), while there are also three locations in County Laois at Parknahown sites 4 and 5 (Grogan and Roche 2008a; 2008b), and The Heath (Keeley 1994). Other sites include Ask, Co. Wexford (Grogan and Roche 2011a), and Scart, Co. Kilkenny (Grogan and Roche 2007; 2008; Laidlaw 2009).

Further to the north there is a dense concentration of sites in the Boyne Valley area (Grogan and Roche 2010a, illus. 6: inset). This includes Knowth and Newgrange (Cleary 1983), as well as examples further to the east in Rathmullan (Sites 6–8, Grogan and Roche 2011b; 2011c; 2011d),

[1] Perhaps of note here is the structured, votive deposition of flint and largely freshly broken pot sherds in the postholes of the timber circle at Knowth (Eogan and Roche 1997, 119–20).

Lagavooren (Grogan and Roche 2012) and Sheephouse (Sites 3 and 4, Grogan and Roche 2011e; 2011f).

Recommendations

The pottery is clean, dry and stabilised and is appropriately packaged; it requires no further treatment.

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CATALOGUE

The Excavation Number (19E0287) is omitted throughout: only the context (in bold) and find number are included (*e.g.* **4**:133). The thickness refers to average dimensions; where relevant a thickness range is indicated. Vessel numbers have been allocated to intact vessels or pottery where some estimation of the form of the pot is possible, or where the detailed evidence of featured sherds (*e.g.* rims, shoulders), decoration or fabric indicates separate pots Rim diameters (or other overall dimensions) are provided where there is a reasonable opportunity to provide accurate measurements; however, these dimensions can vary on individual coil-built prehistoric vessels. The inclusions were examined using simple magnification and, in some cases, attribution reflects probable, rather than certain, identification.
Worn: some wear damage to surfaces and edge breaks much worn: considerable wear damage
Abraded: very considerable wear resulting in loss of surfaces
Inclusions: low content: less than 15%, medium: 15–25%, high: more than 25%

Probable Grooved Ware vessel

***19E0287**:4*

Vessel 1. A heavily disturbed pit produced the truncated and flattened remnants of an upright pot. The recovered material represents about 20% of the base and lower body. The base and some other sherds were conserved, and consolidated (Susannah Kelly, UCD, Cons. No. 9307) but a small amount was left untreated; some of this material consists of individual sherds but most remains imbedded in clay matrix. All of the base itself appears to be present but this has been flattened and distorted. It was flat and unfooted with a sharply defined baseangle. The base itself seems to have been made from a separate disc of clay with the lower body applied to the edges: indeed, smoothing of the wall/base junction continued onto the outer underside of the disc. This feature (a separate disc base) occurs on both late Neolithic and some finer late Bronze Age vessels. The surviving part of the lower body splays out at about 45° but the original profile would have been less, probably *c*. 30°.
This is a fine, well-made and evenly fired vessel of red- to brown-buff fabric with a dark grey inner surface: a two-tone section, buff externally and dark grey internally. There is a medium content of rounded inclusions (generally ≤ 3.26 x 4.70mm, but frequently up to 4.74 x 5.57mm). The external surface is smooth and was finished with a thin slurry (an inclusion-free clay wash). A blackened accretion covers much of the inner surface. Body thickness: 6.4–8.36mm; weight: N/A. Maximum external base diameter *c*. 140mm (now distorted to 136–148mm).
Comment The absence of material from the rim or upper portion of the pot precludes any definite identification but, on balance, this appears to be a late Neolithic Grooved Ware pot. Nevertheless, fine, thin-walled vessels such as this tend to have simple rims—rounded or flat with a slight inward slope. The overall profiles tend to be bucket-shaped or slightly barrel-shaped. In the late Neolithic both tall forms and smaller, tub-shaped vessels form part of the Grooved Ware repertoire.

Context	*Feature*	*Vessel No.*	*Pottery Type*		*Sherds*	*Rim*	*Neck*	*Base/baseangle*	*Body*	*Fragments*	*Crumb*	*Weight (g)*
4		**1**	Grooved Ware		0	0	0	Y	Y	0	0	N/A

Table 1. Prehistoric pottery details from Mooretown, Co. Dublin.

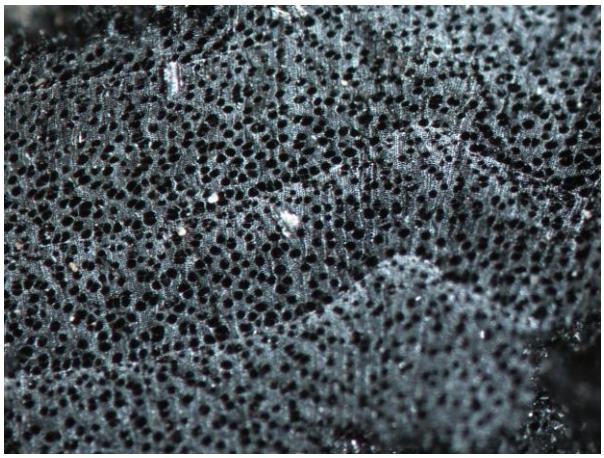
Vessel	Context	Sherds to draw	Details	Photograph
1		Restored base section		

Table 2. Suggestions for illustration: Mooretown, Co. Dublin

Charcoal report

Licence number 19E0287

Mooretown, Swords, Co. Dublin



For: Archaeology Plan

Author- Dr Lorna O'Donnell

Date –11/1/21

Edited 10/2/21

Non-technical summary

Charcoal was analysed from seven pits at Mooretown. Four native Irish tree/shrub taxa were identified. Oak dominates the results while a low level of ash, hazel and alder were also recorded. One pit C2 contained a ~~Bronze Age urn~~Grooved Ware vessel. The fill around the ~~urn~~ vessel C5 has been radiocarbon dated to the cusp of the Late Neolithic/~~Chalcolithic/~~Early Bronze Age period. A low level of oak and alder were identified from C5. The fills of six other pits were also identified. Oak dominates the results from the pits and it was the only taxa present in five out of the six pits. Comparative material from North, West and South Dublin are indicative of cleared woodlands not dominated by oak by the Early Bronze Age. This may suggest that oak was deliberately selected to fuel the pits at Mooretown, as opposed to simply representing the local woodland environment.

Illustrations

Figures

Tables

Contents

1 Introduction

This report describes the assessment and analysis of charcoal from a ~~Chalcolithic~~Late Neolithic/Early Bronze Age site at Mooretown, Swords, North County Dublin. The level of charcoal was assessed from 16 samples (Table 1). Based on this assessment and the contextual results, seven samples were selected for full analysis. The aim of the charcoal analysis is to isolate suitable short-lived taxa for radiocarbon dating, along with examining any contextual variation in the features. Archaeological charcoal can also be used to reconstruct local woodlands and fuel gathering practices.

2 Methodology

2.1 Processing

Samples were floated off site during a programme of post-excavation works undertaken by archaeologists from Archaeology Plan. The individual samples were poured into graduated buckets and the volume of the samples was recorded. Following the addition of water, the floating charred remains (flots) were poured onto a 250micron geological sieve where they were collected and dried for further analysis. The remaining soil was decanted through a 1mm sieve leaving the retent; this is also dried and examined by the archaeologists for artefacts, bone and ecofacts.

2.2 Charcoal identification

It was aimed to identify 50 charcoal fragments randomly per sample (Mc Clatchie *et al* 2015). If 50 fragments are not present in the sample, then all fragments possible are identified. Each piece of charcoal was examined and orientated first under low magnification (10x-40x). They were then broken to reveal their transverse, tangential and longitudinal surfaces. Pieces were mounted in plasticine and examined under a metallurgical microscope with dark ground light and magnifications generally of 200x and 400x. Each taxon or species will have anatomical characteristics that are particular to them and these are identified by comparing their relevant characteristics to keys (Hather 2000; Schweingruber 1978 and Wheeler *et al* 1989) and a reference collection supplied by the National Botanical Gardens of Ireland, Glasnevin. Nomenclature follows Schweingruber (1978).

Each taxon group was weighed in grams to two decimal places. The general age group of each taxa per sample was recorded, and the growth rates were classified as slow, medium, fast or mixed. Ring curvature of the pieces was also noted – for example weakly curved annual rings suggest the use of trunks or larger branches, while strongly curved annual rings indicate the burning of smaller branches or trees (Marguerie and Hunot 2007 1421, Fig. 3). Tyloses in vessels in species such as oak can denote the presence of heartwood. These occur when adjacent parenchyma cells penetrate the vessel walls (via the pitting) effectively blocking the vessels (Gale 2003, 37). Insect infestation is usually identified by round holes and is caused by burrowing insects. Their presence normally suggests the use of decayed

degraded wood, which may have been gathered from the woodland floor or may have been stockpiled.

3 Results

3.1 Overall results

Charcoal was analysed from seven samples from Mooretown, all from pits. 288 individual fragments were identified. Four native Irish tree and shrub taxa were recorded. The most frequent is oak (*Quercus* spp.) which was identified in all seven samples. Alder (*Alnus* spp.) was recorded in two samples, while ash (*Fraxinus excelsior*) and hazel (*Corylus avellana*) were both identified in one sample (Figures 1 and 2).

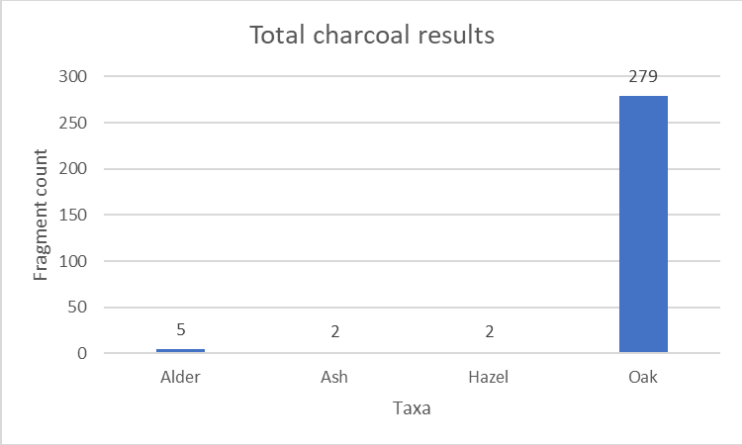


Figure 1 Total charcoal results

3.2 Contextual results

The most significant feature on the Mooretown site was pit C2. This contained a ~~Bronze Age~~Grooved Ware vessel ~~funerary urn~~ (~~McGlade 2019~~Grogan & Roche 2021). Radiocarbon dating from S19, C5 has determined that this context dates to the ~~Chalcolithic~~cusp of the Late Neolithic/Early Bronze Age period (UBA-44024, 2573-2463 cal BC at two sigma calibration). The level of charcoal is low from here, three fragments of oak and two fragments of alder were identified (Figure 2). The highest species diversity is evident in Pit C23 (S3, C25). Mainly oak, along with alder, hazel and ash were recorded from this pit. A high level of oak alone was identified from the remaining pits (Pits C21, C16, C51, C6 and C8) (Figure 2). C21 and C51 represent~~s a~~ fire~~-~~scorched pits (McGlade 2019) so it is likely that it represents *in situ* burning.

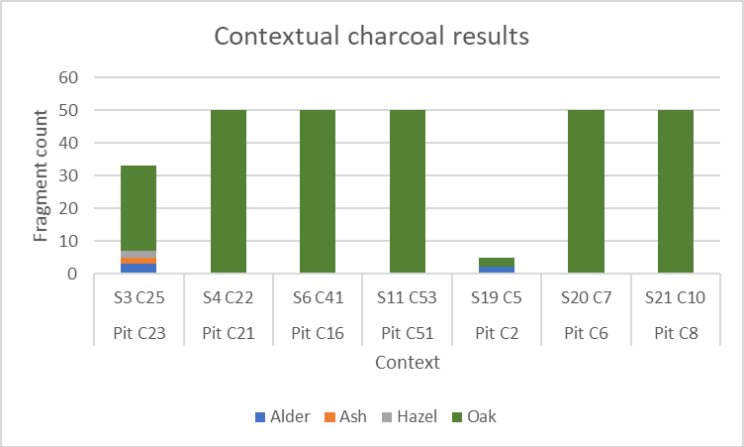


Figure 2 Contextual charcoal results

3.3 Ring curvature and growth

The annual rings on the oak charcoal fragments are all weakly curved in nature, suggesting that larger branches or trunks were burnt at Mooretown. The presence of tyloses in the vessels are indicative of heartwood. In contrast, the hazel fragments have strongly curved annual rings, suggesting that it represents a smaller branch or twig. Mixed ring curvature is evident on the alder fragments indicating that smaller and larger branches were gathered as fuel. Growth is moderate in all cases, with ring counts ranging from 1-23.

4 Discussion

It is likely that charcoal in at least ~~five~~ four of the pits (C23, C16~~, C51~~, C6 and C8) at Mooretown are the result of secondary deposition, where the ashy/charcoal rich contents of hearths were dumped into pits. C21 and C51 had evidence of scorching (McGlade 2019) so the~~y is~~ probably represents burning *in situ*.

The interpretation of charcoal remains from C5, within pit C2 is more complex. A truncated ~~Bronze Age~~ Grooved Ware vessel (C4) survived within the wider eastern end of the pit. C4. The remainder of the pit was filled with a single fill (C5), which contained occasional charcoal flecks that were more prevalent in the vicinity of the vessel. No bone was noted within the vessel C4~~.~~ (McGlade 2019). Charcoal in C5 could potentially be from two types of activity. It could represent general domestic burning on the site which became deposited within Pit C2. Or it could be the remains of wooden pyre material which was used to cremate the body which was presumably housed within the urn C4, before truncation. Previously, it has been noted that oak is the most common tree to have been used in Bronze Age cremations in Ireland (O'Donnell 2016) which compares well to the results from Mooretown. The level of

charcoal is very low within C5 however (only five identifiable fragments, Table 2), so the results must be interpreted with care.

Overall, most common taxa within the deposits at Mooretown is clearly oak which suggests that the site was located close to oak woodlands in the past, which were harvested for fuel. There are two native Irish oaks, and they cannot be separated by wood anatomy. The two species will grow in quite different habitats. The pedunculate oak (*Quercus robur*) will usually grow on heavy, lowland soils, where it will also tolerate flooding. In contrast, the sessile oak (*Quercus petraea*) will grow on less fertile, acidic soils. Oaks can reach a height of 40 metres and live for 1,000 years or more (Hickie 2002, 60). Other tree taxa present in low amounts are hazel, ash and alder. Hazel is a medium sized, deciduous tree, and can reach a height of 15m. It will grow on a wide range of soils, including limestone, mildly acid soils and clays (Lipscombe and Stokes 2008, 102). Ash is a light demanding species, which grows well on limestone soils. It requires many soil nutrients a good source of light (Orme and Coles 1985). A nearby wetland element is suggested by the identification of alder. Ireland's native tree is the black or grey alder (*Alnus glutinosa*). It can often be seen growing alongside rivers, lakes, in marshes or in fens (Stuijts 2005, 139).

At Oldtown, Swords, oak was the dominant wood species recorded from cinerary urn pit C4 and cremation pits C14 and C16 dating to the Middle/Late Bronze Age, albeit with some evidence for hazel, pomaceous woods, holly and ash. It is likely that oak was deliberately selected for funerary activity. The non-funerary contexts suggests that woodlands in the area dating to the Middle/Late Bronze Age were fairly mixed in nature, containing trees such as oak, hazel, ash, holly, blackthorn and pomaceous fruitwood (Lyons 2021, 132). At Dunbro, Dublin Airport, charcoal results from Late Neolithic *fulacht fiadh* material is dominated by ash, followed by alder while birch, elm, hazel and oak were also recorded (O'Donnell 2018a). At Flemingtown, North County Dublin, charcoal results from the Neolithic period are dominated by oak followed by hazel. By the Bronze Age period, the main taxa present are hazel and willow (Lyons 2008). At Balbriggan (Clonard or Folkstown Great) North County Dublin, pollen analysis is indicative of a fairly open landscape by the Later Neolithic period (OCarroll 2018). At the same site, charcoal from a Neolithic cremation pit is dominated by oak. By the Middle Bronze Age, blackthorn was evident and a wide variety of taxa were identified from a Late Bronze Age charcoal spread including ash, blackthorn, oak, alder, elm and holly (OCarroll 2019). Charcoal analysis from Laughaunstown/Brenanstown from South County Dublin demonstrates that woodlands in the area were composed mainly of hazel with a lower level of oak, ash and alder by the Early Bronze Age (O'Donnell 2018b). At Yellowmeadows, West Dublin, charcoal results from Early Bronze Age deposits are dominated by ash, followed by hazel (O'Donnell 2020a). At Ballymakaily, West County Dublin, charcoal results from Chalcolithic/Early Bronze Age deposits are dominated by hazel with oak and ash (O'Donnell 2020b).

Thus charcoal and pollen data from North, West and South Dublin are indicative of woodland clearance in Dublin by and during the Early Bronze Age. Therefore it is relatively unusual to have identified oak only in so many of the Mooretown contexts. This may suggest that oak was deliberately selected as fuel for the fires. Given the radiocarbon date and the form of the pits, it is unlikely that they represent charcoal production pits (S. McGlade, pers.comm.). The high levels of oak may thus be a result of deliberate selection of oak as fuel for other purposes. Osteological analysis has determined that burnt bone was evident in C21 and C23. Possible human burnt bone was recorded in C16 (Keating 2021). Therefore is likely that at least some of the pits at Mooretown are funerary in nature and that the oak present is representative of pyre material. Oak has been demonstrated to have been commonly preferred for pyre fuel in Bronze Age Ireland (O'Donnell 2016) and was selected at the nearby site of Oldtown for Bronze Age funerary activity (Lyons 2021). It is possible that the pits with high levels of oak but no bone present may be also associated with pyre remains (C51, C6 and C8) (Figure 2).

5 Summary

Seven pits were selected for full charcoal analysis from Mooretown. Oak was the main taxa identified while a low level of alder, hazel and ash were also recorded. Pit C2 contained a ~~Bronze Age~~Grooved Ware ~~urn~~vessel. The fill around the ~~urn~~ vessel C5 has been radiocarbon dated to the cusp of the Late Neolithic~~Chalcolithic~~/Early Bronze Age period. A low level of oak and alder were identified from C5.

Oak is the main taxa in the other pits and is the only tree present in five out of six of them. When the results are compared to other sites in Dublin of the same time period, both pollen and charcoal data are suggestive of a fairly open landscape during this time, not predominantly oak climax woodland which would be closed canopy in nature. This may suggest that oak was deliberately selected to fuel the pits at Mooretown, as opposed to simply representing the local woodland environment. The presence of bone in three of the pits indicates that the oak present could be the remains of re-buried funerary pyres.

6 Recommendations

- No further charcoal work is required from the analysed samples
- All flots and identified charcoal should be retained permanently. The industry norm in Ireland is to identify 50 charcoal fragments per sample. For research purposes, this may need to be increased to 50+ (Mc Clatchie *et al* 2015). Further research could include further radiocarbon dating of the charcoal, cumulative frequency work from the samples, ring width analysis research and also identification checks

Acknowledgements
Many thanks to Steve McGlade for assistance on this project.

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Table 1 Charcoal assessment from Mooretown

Sample	Context	Cut	Feature type	Charcoal assessment
1	C10	C8	Pit	Low
2	C13	C12	Pit	Low
3	C25	C23	Pit	Medium
4	C22	C21	Pit	Medium
5	C19	C16	Pit	Medium
6	C41	C16	Pit	Medium
7	C40	C16	Pit	Low
8	C36	C35	Pit	Low
9	C34	n/a	Charcoal spread	Low
11	C53	C51	Pit	High
12	C50	C49	Pit	Medium
13	C47	C35	Pit	Low
14	C54	n/a	Charcoal spread	Low
19	C5	C2	Prehistoric pit with vessel	Low
20	C7	C6	Pit	Medium
21	C10	C8	Pit	Medium

Table 2 Charcoal identification details from Mooretown

Sample	Context	Cut	Feature type	Identification	Common name	Weight (g)	Fragment count	Ring count	Size (mm)	Ring curvature	Growth	Charcoal comment	Flot comment
3	C25	C23	Pit	*Alnus glutinosa* Gaertn.; *A. incana* DC	Alder	0.08	3	2-3	2	Moderate	Medium		All identifiable charcoal identified
3	C25	C23	Pit	*Corylus avellana* L.	Hazel	0.03	2	2	2	Strong	Medium		All identifiable charcoal identified
3	C25	C23	Pit	*Fraxinus excelsior* L.	Ash	0.04	2	2	2	Indeterminate	Medium		All identifiable charcoal identified
3	C25	C23	Pit	*Quercus petraea* Liebl; *Q. robur* L.	Oak	0.28	26	2-3	2-5	Weak	Medium	Tyloses	All identifiable charcoal identified
4	C22	C21	Pit	*Quercus petraea* Liebl; *Q. robur* L.	Oak	4.52	50	2-5	4-8	Weak	Medium	Tyloses	Sub-sample of 50 fragments identified
6	C41	C16	Pit	*Quercus petraea* Liebl; *Q. robur* L.	Oak	14.29	50	4-6	5-10	Weak	Medium	Tyloses	Sub-sample of 50 fragments identified
11	C53	C51	Pit	*Quercus petraea* Liebl; *Q. robur* L.	Oak	7.52	50	2-23	15-19	Weak	Medium	Tyloses	Sub-sample of 50 fragments identified

Sample	Context	Cut	Feature type	Identification	Common name	Weight (g)	Fragment count	Ring count	Size (mm)	Ring curvature	Growth	Charcoal comment	Flot comment
19	C5	C2	Prehistoric pit with vessel	*Alnus glutinosa* Gaertn.; *A. incana* DC	Alder	0.03	2	2	2	Strong	Medium		All identifiable charcoal identified
19	C5	C2	Prehistoric pit with vessel	*Quercus petraea* Liebl; *Q. robur* L.	Oak	0.03	3	2-3	3	Weak	Medium		All identifiable charcoal identified
20	C7	C6	Pit	*Quercus petraea* Liebl; *Q. robur* L.	Oak	0.88	50	1-3	2-10	Weak	Medium		Sub-sample of 50 fragments identified
21	C10	C8	Pit	*Quercus petraea* Liebl; *Q. robur* L.	Oak	1.22	50	2-5	1-10	Weak	Medium		Sub-sample of 50 fragments identified

BURNT & UNBURNT BONE FROM THE SITE OF MOORETOWN, SWORDS, CO. DUBLIN (19E0287)

Specialist report prepared for
Archaeology Plan
(Director: Steve Mc Glade)

Denise Keating

Contents

Materials

A total of 4 contexts containing burnt and unburnt bone were analysed from the site of Mooretown, Swords, Co Dublin under licence number 19E0287. These derived from a fire pit (C21), a prehistoric pit containing the fragmentary remains of a Bronze Age vessel (C2), and from the charcoal-rich layers of two further pits, one in the southwest of the site (C23), the other in the east (C16)

Methods

The approach adopted for the analysis of these remains was, primarily, that taken for the analysis of burnt human bone. The remains were analysed macroscopically after McKinley (2004) with each sample being analysed in three sieve fractions: 2mm fraction (>2mm to ≤5mm), 5mm fraction (>5mm to ≤10mm) and 10mm fraction (fragments >10mm). Details of colour, weight, fragment size and species identification were recorded and can be seen detailed in the accompanying appendix.

The details of the bones' archaeological context was first analysed in order to determine the type of deposit (pyre/pyre debris/burial/burial-related deposit/cenotaph) under investigation (McKinley 2004: 10) and to determine if any indication of disturbance was found. The total weight of a sample of cremated bone, together with a measure of its maximum fragment size, can give an assessment of the degree of bone fragmentation (McKinley 2004: 9). Therefore, the total weight and the individual fraction-weights are presented for each sample. Weights are accurate to ±0.01g and are recorded to one decimal place as per McKinley (2004).

Every fragment of bone was examined for evidence of identifiable features. Where possible, skeletal elements are then identified to anatomical structure. A fragment is only considered identifiable where it can be placed to element (e.g. humerus, femur). All fragments were examined for evidence of the presence of pathological processes active in the bone and evidence for faunal and other inclusions was also sought.

Results

Type of deposit

Burnt bone can typically be divided into three types of deposit: urned cremations, un-urned cremations and "cremation-related deposits" (McKinley 2004: 10). The latter describes deposits which, although they contain human bone, do not appear to represent what could be described as a defined burial. One deposit at the site of Mooretown, C2, can be described as an urned cremation. The three remaining contexts from which bone derived were less well-defined, having produced primarily unidentifiable small bone fragments.

Cremation Pit C2

Pit C2 was a pear-shaped pit located centrally within the site and which contained the truncated remains of a Bronze Age vessel.

Level of disturbance

The condition of cremated bone may be affected by the type of deposit from which it derived (e.g. urn cremation burials, cist cremation burials), by taphonomic processes (soil conditions, animal burrowing or gnawing) and by excavation and post-excavation processing (McKinley, 1993). Therefore, the level of disturbance should be assessed in each case.

Pit C2 contained the remains of a heavily truncated Bronze Age vessel which had been severely damaged by successive instances of ploughing, leaving just the base and part of the side of the vessel remaining (McGlade, 2019). Although no bone was noted at the time of excavation, the fills of the pit were 100% sampled and 5 small fragments of burnt bone were retrieved.

Total weight of bone and degree of fragmentation

The total weight of the bone from this pit was 0.4g, with all fragments deriving from the 2mm sieve fraction. Although neither the age, sex nor indeed the number of individuals that may have been interred in the cremation vessel is known, it is clear that this represents a miniscule portion of what could have been deposited. Given that the typical weight of burnt adult human remains can range between 1000g and 3600g (McKinley, 1993), the comprehensive destruction of this deposit is evident.

Identified material and demographic data

There were no identifiable bone fragments from this feature. It was not possible to definitively identify species, but the fragments were deemed likely to be of human origin.

Efficiency of cremation/burning

The differing colours observed in burnt bone are a reflection of the degree of oxidation of its organic component (Holden et al., 1995). The bone fragments from the pit containing the cremation pot were white in colour, reflecting full oxidisation where temperatures of >800^{o}C were likely to have been achieved (McKinley, 2002).

The loss of the organic component of bone through exposure to heat and associated dehydration also leads to characteristic fissuring and warping of the bone surface (McKinley, 2002). This can be analysed

to further elucidate the funerial process. However, at the 2mm fraction size, it is not possible to determine which deformation patterns occurred due to the small size of the fragments.

Presence and type of pyre goods and pyre debris

No evidence of pyre goods or debris were detected.

Pit C16

C16 was a sub-oval pit which contained a number of charcoal-rich fills. One of these was C41 and it produced burnt and unburnt bone as well as a flint flake.

Level of disturbance

Pit C16 had sustained some disturbance in antiquity. The fire pit (C21), discussed below, cut the upper part of the eastern side of the pit.

Total weight of bone and degree of fragmentation

The total weight of the burnt bone from C41 was 0.83g and comprised of 30 fragments, all of which derived from the 2mm sieve fraction. The unburnt bone, representing find numbers 1 and 2 presented total weights of 0.58g (4 bone fragments) and 6.56g (22 bone fragments) respectively. These two were somewhat larger, being of the 5mm fraction size.

Identified material and demographic data

It was not possible to determine any identifying features in the bone from C41. The 'Find 2' bones were deemed possibly human as part of a mandible was identified which appeared somewhat gracile but the species of the remaining fragments was unidentified.

Figure 1: Alveolar fragment. Find 2. Pit C16.

Efficiency of cremation/burning

The burnt bone from this layer was white overall with occasional black charred fragments, suggestive of somewhat lower temperatures in parts of the bone and/or the pyre/fire. A single white fragment displayed a fleck of blue.

Presence and type of pyre good and pyre debris

There was no evidence of any pyre-type materials from this deposit.

Fire Pit C21

Pit C21 was a later pit with *in-situ* evidence of burning. Its fill, from which the burnt bone derived, was charcoal-rich (McGlade, 2019). This pit also cut the upper part of the eastern side of pit C16 (discussed above).

Level of disturbance

There was no apparent disturbance to the fire pit C21.

Total weight of bone and degree of fragmentation

The total weight of burnt bone was just 0.4g and all 18 fragments derived from the 2mm sieve fraction.

Identified material and demographic data

It was not possible to identify species in this instance.

Efficiency of cremation/burning

The bone fragments that derived from this pit were white with occasional blue flecks, the latter indicating parts of the bone that did not achieve as high a temperature as those which were white in colour.

Presence and type of pyre good and pyre debris

There was no direct evidence that this pit was related to a pyre or the cremation process.

Pit C23

Pit C23 was a steep-sided, flat-bottomed pit, the upper fill of which (C25) was charcoal-rich and produced fragments of burnt bone (McGlade, 2019)

Level of disturbance

Pit C23 was cut by pit C26. These were two pits with a clear resemblance to one another (McGlade, 2019). Each one was comprised of a lower main fill which was pebbly and largely sterile, and an upper fill which was charcoal-rich. The similarity between the two intercutting pits suggests a specific function which was repeated in this particular location (*ibid.*).

Total weight of bone and degree of fragmentation

The total weight of the burnt bone which derived from C25 (the charcoal-rich upper fill) was 0.81g. This comprised of 6 fragments, all of which derived from the 2mm fraction size.

Identified material and demographic data

It was not possible to determine species in this case.

Efficiency of cremation/burning

The bone that derived from this context was white overall with occasional grey flecking.

Presence and type of pyre good and pyre debris

There was no pyre-related evidence from this context.

Discussion

The burnt and unburnt bone assemblage from Mooretown derived from a number of context types. These were an urned cremation (C2), a fire-pit (C21) and two further pits of unknown function (C16 and C23). The MNI (minimum number of individuals) of the site was 1. No further useful demographic data could be gleaned from the scant and fragmented remains. However, other recorded data from the bones can prove useful in the interpretation of the features within which they occurred.

The majority of the bone from Mooretown had been subject to burning. Only Finds 1 and 2 from Pit 16 were found to be unburnt. Most of the burnt bone was white in colour, with some fragments displaying black or blue flecks. Cremation and burning of bone is a process of dehydration and oxidation of the organic components of the body, of which bone is about 30% composed (McKinley, 2002: 403). Therefore the characteristic white colouration of cremated and burnt bone indicates complete oxidisation (Shipman et al., 1984). Before full oxidation is achieved, however, bone transitions through a number of colours from the blackening of slightly charred bones through the blues and greys indicative of greater sustained heat but it is the full calcination or oxidation of bone, likely to occur at temperatures over 800^{o}C, that results in the typical white colouration of cremated remains (*ibid*.). Colour can also vary based on the type and density of soft tissue coverage in each part of the body as well as its position on the pyre (McKinley, 2002: 407). Not all bones will oxidise at a standard or predictable rate. McKinley (2002: 405) notes that it is common to see a range of colours throughout a cremation burial, reflecting the varying conditions of heat, body position and tissue coverage and this was certainly the case in the bones from Mooretown.

Whilst the function of the urned cremation pit and, to an extent, the fire pit are clear, the function of the two remaining pits is less so. It may be the case that these were entirely unrelated to the funerial process or, they may represent small portions of pyre debris, where the remains of the fire and any bone fragments that escaped the collection process were retrieved and deposited. The way in which the final product of a cremation – both bones and the associated pyre materials – were treated in the past varies widely. While some sites appear to reflect the deliberate process of selection of bone from the pyre (e.g. Bronze Age Kilree 1), others show a preference for high volumes of pyre material (e.g. Templenoe) (O' Donnell 2016: 169). O' Donnell (*ibid.*) has suggested that there may have been a practice of picking through pyre material to remove bone (rather than the often-assumed opposite) in order to bury pyre material. Therefore, not only should the apparent paucity of burnt bone in some cremation deposits be viewed as intentional and meaningful, rather than anomalous, so too should the deposition of charcoal-rich deposits, containing bone. Cooney (2017) draws attention to the fact cremated bone has been recorded in other locations, such as domestic contexts, possibly serving as a way to mobilise the dead, to make the deceased more portable and capable of being shared out among the living. In this way, it is possible to imagine that a variety of cremation-related deposit types should be expected in the landscape, not all of which will contain large quantities of bone. Pits 16 and 23 may represent such instances. However, without definitive species identification, it is difficult to suggest with any certainty that these features are related to the cremation process.

Conclusion

At least one of the deposits from Mooretown can definitively be said to have derived from the cremation rite. The fragmentary remains of both the Bronze Age vessel and the human remains is testament to that. Cremation is a process of unappreciated complexity (Cooney, 2017: 118) and requires considerable effort on the part of the community involved. It was not possible to glean any data directly relating to the individual(s) for whom the rite was performed, due to the poor preservation that the deposit exhibited, but the significance of the performance of that rite cannot be underestimated. The retrieval of human remains and their deposition in the ground are simply the final act of what is a complex and many-faceted ritual. It is said that time, temperature and oxygen are the necessary criteria for cremating human remains (McKinley, 2002) and the collective resources that must be pooled within a community to provide these elements should not be underrated. All processes, from the selection and retrieval of wood – important not just for its calorific value or burn quality, but for its perceived symbolic resonance – to the labour-intensive feeding and tending of the pyre in an outdoor setting, where the vagaries of precipitation and wind-strength and direction must be managed, all speak to the importance of this rite as a symbolic and performative process (Cooney, 2017).

The proximity of the other pits at Mooretown to the central cremation pit may suggest their peripheral use or involvement in the performance of this or other cremations, although this is far from definitive. The identification of pyre sites and cremation-related deposits in the landscape is challenging, partly due to the inexplicit nature of some of these types of features, and partly due to our inability to recognise this type of deposit, with so few have been identified across the country to date. However, the consideration of bone-containing, charcoal-rich deposits found in association with cremation deposits may be warranted in our pursuit to better understand the cremation rite in Ireland.

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Appendix

	Find No	Cut	Fill	Sample No	Weight (g)	No Frags	Fraction	Colour	ID
Burnt bone	–	2	5	19	0.4	5	2mm	White	Probable human
Burnt bone	–	16	41	–	0.83	30	2mm	White, occ. black frags. Single blue fleck	Unidentified
Unburnt bone	1	16	41	–	0.58	4	5mm	-	Unidentified
Burnt bone	–	21	22	3	0.44	18	2mm	White, occ. blue flecks	Unidentified
Unburnt bone	2	16	41	–	6.56	22	5mm	-	Possible human
Burnt bone	3	23	25	–	0.81	6	2mm	White, grey fecking	Unidentified

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Radiocarbon Date Certificate

Laboratory Identification:	UBA-44024
Date of Measurement:	2020-11-23
Site:	Mooretown
Sample ID:	19E0287:5 SS19
Material Dated:	charcoal
Pretreatment:	AAA
mg Graphite:	1.200
Submitted by:	Steven McGlade

Conventional ^{14}C Age:	3986±25 BP
Fraction corrected	using AMS $\delta^{13}C$

UBA-44024
44024
Radiocarbon Age BP 3986 +/- 25
Calibration data set: intcal20.14c

% area enclosed	cal AD age ranges	# Reimer et al. 2020 relative area under probability distribution
68.3 (1 sigma)	cal BC 2564- 2534	0.548
	2494- 2469	0.452
95.4 (2 sigma)	cal BC 2573- 2512	0.579
	2504- 2463	0.421

Median Probability: -2527