N8 Cashel Bypass & N74 Link Road

Phase 2 Archaeological Investigations

Licence Number:	03E0378
Site Name:	Site 13
Townland:	Monadreela / *Móin na Draoile*
Barony:	Middlethird
Parish:	St. Patricks Rock
County:	Tipperary
NGR:	209630 / 141683 (pit 83)
OD Level:	148.50 m (centre of site)
Excavation Area:	3,500 m²
Fieldwork Date:	May 2003
Site Director:	Neil O'Flanagan
Report Author:	Richard O'Brien
Client:	Tipperary County Council
Report Status:	Final Report
Report Date:	October 2014

Comhairle Contae Thiobraid Árann
Tipperary County Council

NRA
An tÚdarás um Bóithre Náisiúnta
National Roads Authority
Archaeology

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EXECUTIVE SUMMARY

This report contains the final results of an archaeological excavation carried out as part of the N8 Cashel Bypass & N74 Link Road (03E0378). Site 13 (chainage 6540–6590) was situated in the townland of Monadreela, at the base of the south-east facing slope of the Monadreela/Boscabell hillside, and overlooked by Ballyknock Hill, a prominent landmark in the Cashel area. To the east of the site was situated a low lying area of ground prone to flooding.

On Site 13 there were two unlined, earth-cut pits spaced 2 m apart. The basal fill of pit [83] had a polished stone axe, sherds from 10 Beakers, worked flint (debitage too), burnt clay, possible slag, a hammerstone, quartz, plus charcoal of hazel, alder, oak, ash with barley and crab-apples. The 15.3g of burnt bone was identified as animal. Hazel charcoal from basal fill (85) was dated 2457-2204 cal BC. The pit was then sealed (very quickly), and from this upper deposit (84), further alder, oak, cherry-type, ash, hazelnuts and pomaceous was found. The excavator originally thought the pit was a burial, and that one irregular pit edge had held a post. The second pit [86] had a basal fill (99) from which alder charcoal was dated 2334-2140 cal BC. Also it contained worked flint, burnt clay, evidence of another two Beakers (different to the other 10), emmer, barley, oat and oat chaff, plus oak, hazel and ash. This deposit was sealed (again, very quickly) by a deeper deposit (87) containing hazelnuts, oak, ash and alder. This later deposit had ash charcoal dated 2467–2236 cal BC. This pit contained no burnt bones. All the evidence points to domestic refuse pits. Both were found only 2 m from the edge of the road-take so there must be a significant Copper Age settlement upslope at Monadreela. There are abundant contemporary sites around Cashel too. Two other features dated from 1299–1059 BC (UBA-13734) and the very beginnings of the Iron Age in the Cashel area, 806–598 BC (UBA-13735). The remaining features on site were undated; some of these had characteristics commonly found in prehistoric features around Cashel, but other undated features could be associated with the nearby 18th/early 19th century homestead, excavated as Site 14.

Due to the archaeological discoveries along the edge of the Monadreela hillside, it is a recommendation in this report that the fields surrounding the site be subject to archaeological investigations prior to any proposed developments taking place. These fields should also be field-walked for research purposes should the land use ever revert to tillage.

INTRODUCTION

This report contains the final results of an archaeological excavation carried out as part of the N8 Cashel Bypass & N74 Link Road. The scheme involved an 8 km bypass of the town and a 2 km link road to the N74 (Figure 1). South Tipperary County Council completed the bypass and the new roads opened in October 2004. The project was funded by the Irish Government under the National Development Plan, 2000–6. The total archaeological cost was administered by the National Roads Authority through South Tipperary County Council, as part of the Authority's commitment to protecting our cultural heritage.

Project Background

RPS Consultants Ltd carried out a desk-based archaeological survey of the N8 Cashel Bypass and N74 Link Road route in 1995, recommending an eastern bypass of the town so as to avoid direct negative impacts on the Rock of Cashel, a National Monument (Cronin 1995). There was no Environmental Impact Statement (EIS) prepared for the project. RPS Consultants Ltd compiled an archaeological impact assessment of the route in 1999 (Lane 1999). The report identified five sites of cultural significance that would be directly impacted upon by the construction of the N8 Bypass. In addition five sites of archaeological potential were discovered by the Project Archaeologist from the examination of aerial photographs and a walkover survey of the route in April 2001. Between April and May 2002, Phase 1 Pre-Construction Archaeological Testing of these ten cultural heritage sites was undertaken by Mary Henry Archaeological Services, under Excavation Licence Numbers 02E0286, 02E0287, 02E0288, 02E0374, 02E0375, 02E0376, 02E0377, 02E0378, 02E0379 & 02E0380 (Lennon 2002). Those townlands investigated were Gortmakellis, Ballyknock, Monadreela, Boscabell, George's-Land, Windmill and Farranamanagh. Archaeological features discovered during this work formed the basis of the Phase 2 investigations of the bypass in 2003.

In 2003 a joint venture company Judith Network Archaeology Ltd (JCNA) was contracted by South Tipperary County Council to undertake Phase 2 works. This involved further archaeological testing of areas of the bypass previously unavailable, carried out under Excavation Licence Number 03E0295. Phase 2 works also involved Fixed Price archaeological resolution of a number of sites discovered in the Phase 1 works. Thus both testing and resolution works often occurred within the same field. This work began in April and continued until August 2003, during which the main construction contractor Roadbridge Ltd began on-site works. The bypass officially opened in 2004. Initial post excavation works began in August 2003 but were suspended as JCNA Ltd went into

liquidation in January 2004. Over the succeeding years some preliminary reports were issued by the various licence holders on an individual basis, while some specialist works were undertaken. Between 2008–10 the baulk of report writing and specialist analysis was completed under the supervision of the NRA Project Archaeologist. Remaining work since 2011 was undertaken directly by the NRA Project Archaeologist.

Project Description

The N8 Cashel bypass began north-east of Cashel town, *c.* 3.5 km from the Rock of Cashel, in the townland of Gortmakellis. The bypass generally kept to the east side of Cashel for most of its length so as to minimise visual impacts on the Rock of Cashel. It continued south through flat, good agricultural land, before rising gradually and cutting through the eastern end of Ballyknock Hill, *c.* 166 m OD, at the western end of the Slieveardagh ridge. The bypass continued south through slightly undulating ground, skirting the eastern side of the Monadreela ridge, *c.* 151 m OD. The lower part of this ridge was low-lying, heavily water-logged ground. The bypass continued south-east through relatively flat land, before terminating 2 km south of Cashel in Owen's and Bigg's-Lot townland. The mainline of the bypass measured *c.* 70–80 m wide.

The N74 Link Road began in Windmill townland *c.* 400 m from the old N8 Cork road end of the bypass, heading west and then north-west for its length. The route skirts close to the hilltop enclosure at Windmill TI061-072, before descending through Windmill along flat, good agricultural land, before cutting through a low ridge in Deerpark townland. The route descended through Farranamanagh townland continuing north toward the N74 Tipperary road. The link road was 2 km in length, and *c.* 60 m wide.

The project was designed to avoid in as much as practical all known archaeological sites located close to the CPO such as Gortmakellis ringfort TI061-003, Gortmakellis tower house TI061-011, Ballyknock ringfort TI061-008, Boscabell moated site TI061-027, Rathordan ringfort TI061-074, Windmill ringfort TI061-072, Windmill Leper Hospital (*site of*) TI061-073, Windmill moated site TI061-167 and Farranamanagh ringfort TI060-084. The investigation of the *Rian Bo Phadriag* roadway (TI061-071) was the only example where the bypass directly impacted a known RMP site and this was unavoidable as the roadway had to be traversed by the bypass.

Excavation Methodology

The investigations began in Spring 2003 across the entire bypass although lands at Owen's and Bigg's-Lot were unavailable for investigation until July. All sites were investigated by

mechanical excavators under constant archaeological supervision. The topsoil was removed down to the natural glacial till, or to the top of archaeological features, depending on what was encountered first. In the main the natural consisted of compacted yellow-orange clay. In areas of water-logged conditions such as at Monadreela, George's-Land and Owen's and Bigg's-Lot the natural changed to grey-white malleable clay. In areas of higher ground in Ballyknock, Windmill and Deerpark bedrock limestone outcropped close to the base of the topsoil. In particular on the north-west-facing slope of Windmill Hill (Sites 31–35) and Windmill / Deerpark ridge the natural contained limestone bedrock outcropping overlaid by bands of gravel (Sites 38–39). A cave is shown on the 1st Edition OS Map at the extreme south-west corner of Hughes'-Lot East, near the Corporation Boundary junction with Waller's-Lot.

A total of 56 Excavation Licence Numbers were issued by the Department of Environment, Heritage and Local Government during the course of the bypass archaeological works. This total included the general archaeological testing licence 03E0295 which was used across the scheme, the specific testing of the *Rian Bo Phadriag* roadway (TI061-071) in Owen's and Bigg's-Lot 03E1211, and the archaeological monitoring of bypass outfall drains across various townlands, 03E1087. In most instances the licence issued for specific archaeological testing of a site was retained for the subsequent resolution of that site, as resolution followed on immediately once archaeology was definitively identified.

The following tables list those sites on the N8 Bypass mainline and N74 Link Road where excavations uncovered definitive archaeological remains (see below). What is clear from these tables is the multi-period nature of many of the sites investigated. Such discoveries have been mirrored on both NRA-funded projects north and south of Cashel, although it is clear the density of sites uncovered around Cashel is exceptional (McQuade 2009, xiii). Although it could be explained that this higher site density was due to Cashel's prominence as an ancient royal capital in the early historic era, the higher numbers of prehistoric sites appears to indicate intense settlement around Cashel from the beginnings of the Early Bronze Age. The good quality farming land, based on brown podzolic soils over limestone bedrock, was a main attraction for settlement. Coupled with this was Cashel's strategic location south of the bog lands around Littleton/Thurles, and north of the Galtee Mountains and River Suir plain. Although Cashel has no river many small streams (Arglo, Black, Halfmile & Maddock) fed by a widespread system of ponds served as convenient water sources: it was no coincidence that when excavations occurred beside

these ponds i.e. Monadreela, Boscabell and Owen's and Bigg's-Lot, multi-period sites were uncovered.

Monadreela

Prior to excavations commencing there was only one RMP site in Monadreela, (TI061-020), which lay on the eastern boundary of the townland. It was a large oval enclosure open at its north-west corner, *c.* 200 m from the CPO and bulldozed sometime after the mid 1950's as it was not depicted on the 3rd Edition OS Map (see Figure ix below).

A comprehensive programme of archaeological testing was undertaken by Mary Henry Archaeological Services Ltd during Phase 1 testing in spring of 2002. Under excavation licence number 02E0286 a 160 m length of the bypass was tested in Monadreela between chainages 6520–6680, designated as Strip Area 4 (Lennon 2002, Drawing 1). This work identified definitive archaeological features which became designated as Sites 10, 12 and 14 respectively (Lennon 2002, Figures 1, 2 & 4–6, Plates 1–4, Contexts C1–C26, C28–C31 & C35). As Site 13 lay between areas of known archaeology between chainage 6540–6590 it was decided to undertake additional testing during Phase 2 works in spring 2003 (Hughes & MacLeod 2003a). This work revealed a number of features associated with the features on Site 12 and following consultation with South Tipperary County Council an area measuring 50 m north-south by 66 m east-west (*c.* 3,300 m²) was fully stripped. The excavation of those features revealed during testing was carried out by Judith Carroll Network Archaeology Ltd (JCNA Ltd) in May 2003, under the direction of Neil O'Flanagan, under licence 03E0378 (O'Flanagan 2006h; & various testing reports).

Site No	Licence No.	Townland	Mesolithic	Neolithic	Copper Age	Early Bronze Age	Middle Bronze Age	Late Bronze Age	Iron Age	Early Medieval	Medieval	Post Medieval
			7000–4000 BC	4000–2400 BC	2400–2200 BC	2200–1600 BC	1600–1100 BC	1100–800 BC	800 BC–400 AD	400–1200 AD	1200–1500 AD	1500–1900 AD
1i	03E0673	Ballyknock										
1ii	03E0740	Ballyknock										
1iii	03E0727	Clonmore										
5	03E0299	Monadreela										
7	03E0300	Monadreela										
8	03E0379	Monadreela										
9	03E0345	Monadreela										
10	03E0392	Monadreela										
11	03E0346	Monadreela										
12	03E0393	Monadreela										
13	03E0378	Monadreela										
14	03E0395	Monadreela										
15	03E0394	Monadreela										
16	03E0427	Boscabell										
17	03E0413	Boscabell										
18	03E0425	Boscabell										
19	03E0426	Boscabell										
20	03E0470	Boscabell										
21	03E0480	Boscabell										

22	03E0503	George's-Land											
23	03E0508	George's-Land											
24	03E0507	George's-Land											
25i	03E0731	Kilscobin & Hughes'-Lot East											
25ii	03E0730	Kilscobin & Hughes'-Lot East											
25iii	03E0746	Hughes'-Lot East											
25iv	03E0807	Hughes'-Lot East											
25v	03E0756	Rathordan											
27	03E0289	Waller's-Lot & Rathordan											
29	03E0287	Waller's-Lot											
30i	03E0754	Cooper's-Lot											
30ii	03E0762	Cooper's-Lot											
30iii	03E1086	Owen's and Bigg's-Lot											
42	03E0582	Gortmakellis											
TI061:071	03E1211	Owen's and Bigg's-Lot											

Table i: Excavations undertaken on the N8 Cashel Bypass mainline

Site No	Licence No.	Townland	Mesolithic 7000–4000 BC	Neolithic 4000–2400 BC	Copper Age 2400–2200 BC	Early Bronze Age 2200–1600 BC	Middle Bronze Age 1600–1100 BC	Late Bronze Age 1100–800 BC	Iron Age 800 BC–400 AD	Early Medieval 400–1200 AD	Medieval 1200–1500 AD	Post Medieval 1500–1900 AD
31	03E0391	Windmill										
32	03E0399	Windmill										
33	03E0398	Windmill										
34	03E0418	Windmill										
35	03E0424	Windmill										
36i	03E0675	Windmill										
36ii	03E0676	Windmill										
37	03E0419	Windmill										
38	03E0760	Windmill, Deerpark & Farranamanagh										
39	03E0757	Farranamanagh										
40	03E0502	Farranamanagh										
41	03E0674	Farranamanagh										

Table ii: Excavations undertaken on the N74 Link Road

Table ii illustrates the very prominent geographical attraction of the upland areas of Windmill Hill and Windmill / Deerpark, being the focus of settlement and ritual activity throughout prehistory. For Windmill Hill itself (Sites 31–36i) there is an apparent hiatus in activity between the Late Bronze Age and Medieval periods, centred round the hilltop enclosure (TI061-072): it is likely the enclosure itself was occupied during this time with the surrounding fields perhaps used for agriculture rather than settlement.

Table iii lists those sites where licences were issued and investigations proved to be non-archaeological:

Site No.	Licence No.	Methodology	Townland
1iii	03E0727	Resolution	Clonmore
2	03E0297	Testing	Ballyknock
3	03E0296	Testing	Ballyknock
4	03E0298	Resolution	Monadreela
6	03E0349	Testing	Monadreela
25vi	03E0747	Resolution	Rathordan
25a	03E0294	Resolution	Waller's-Lot
26	03E0347	Resolution	Rathordan
28	03E0292	Resolution	Waller's-Lot
43	03E1087	Monitoring	various
1, 1a, 25, 30, 36, 38	03E0295	Testing	various

Table iii: Excavations which produced non-archaeological sites

No further works were undertaken on these sites. As the bypass was a design-and-build-type project design changes were made during the construction period in 2003. Such changes only involved works within the Compulsory Purchase Order lands (CPO), and were subject to the prior approval of South Tipperary County Council. These changes meant that some areas which had been archaeologically tested were not impacted further and therefore archaeological remains were preserved *in situ*. Such areas have been identified in each relevant final report and notified to the Archaeological Survey of Ireland:

Site	Licence	Townland	NGR	Description
Site 22	03E0503	George's-Land	209522 / 141100	ploughed-out *fulacht fia* dated to the Early Bronze Age
Site 24	03E0507	George's-Land	209520 / 140985	undated pits & ditches
Site 25ii	03E0730	Hughes'-Lot East	209380 / 140607	western portion of an Early Medieval ringfort
Site 25iv	03E0807	Hughes'-Lot East	209317 / 140363	eastern portion of an Early Medieval ringfort
Site 25v	03E0756	Rathordan	209140 / 140070	pits & ditches, one date from the Late Bronze Age

Table iv: Excavations where portions of the archaeology was preserved *in situ* within the CPO

Local Information

The route of the bypass traversed a number of upstanding townland boundaries generally consisting of high clay and/or stone banks topped with hedging, occasionally with a ditch either on one side or both. In some cases these ditches were active streams (Boscabell / George's-Land boundary; George's-Land / Hughes'-Lot East boundary). The townlands of

Gortmakellis, Ballyknock, Monadreela, Boscabell, George`s-Land, Kilscobin and Rathordan were located within St. Patricks Rock parish. At the George's-Land / Hughes'-Lot East boundary (Site 25i) the route entered St. John Baptist parish, formerly the Cashel Corporation Municipal Boundary too, and included the townlands of Hughes'-Lot East, Waller's-Lot, Cooper's-Lot and Owen's and Bigg`s-Lot. On the link road Windmill was located within Part of St. Patricks Rock parish. At the junction of Windmill / Deerpark (Site 38) the route entered Farranamanagh in the parish of Hore Abbey. The profiles of townland boundaries were recorded during excavation and incorporated into the relevant final report. Changes to these boundaries over time can be traced in the Historical Background section below.

There are many interesting place names around Cashel recorded cartographically and / or in historical sources, such as *Poulmawkeorish* in Castlelake; *Poulagower* in Attykit; *Foresdin* in Hill's-Lot; *Carrigeenedeen* and *Fawnsuir* in Carron; *Parknapeast*, *Turreen Spring* and *Mullenavivva Pool* in Ballinamona; *Knockananulla* in Hore Abbey; *Granias Well* in Deerpark; *Loughroentaggart*, *Lough Nahinch* and *Doon Fort* in Farranamanagh; *Ogaunoch and Coun* [Rathcoun?] *and the hill of Tubbiradoon...a well called Tubbiradoon near Doon Fort* (Davis White 1866, 47); *Goul's Pool* in Waller's-Lot; *Corralough Well* in Corralough; *Gallows Hill* in Hughes'-Lot East; *the Fahy and the common lands of the town alias Cottyne* (Fiants 1994, 485); '*Brockroghtie and a meadow near Gallows hill called Monyarnycrohy*' (IMC 1966, 281).

GEOLOGY & SOILS

The Cashel environs are situated on the eastern edge of the Golden Vale, and the southern edge of the central limestone plains of Ireland. The landscape has been formed by glacial melt water and moraine deposition. The bypass route traversed the low-lying, fertile, well-drained and easily worked soils with underlying calcareous tills, which sweep away from the Knockmealdown and Galtee Mountains and Slievenamon to the south.

Ballyknock, in the north of the main route, and Windmill, in the southern part of the link road, are high prominent landmarks. The undulating land is made up of gently sloping rounded ridges oriented east-west. The streams create a cross-drainage system running between the ridges and along the bottom of the slopes, eventually flowing to the west, towards the River Suir drainage basin. The rock type of the area is composed of limestone from the Carboniferous period. On the west and south-west are the Hore Abbey Limestone and Lagganstown formations. To the south-east is the Ballyadams formation, with the Killeshin Siltstone and Clogrenan formations to the north-east and north respectively. The Hore Abbey formation consists of pale grey bedded limestone with chert, with the Lagganstown formation made up of dark thin cherty limestone. The Ballyadams formation is a Burren-type limestone with thick ledges. The Clogrenan formation is bluish-grey limestone with irregular nodules of black or blue chert, wackestones and packstone limestone. The Killeshin Siltstone formation is composed of muddy siltstone and silky mudstone (Archer, Sleeman & Smith 1996).

Geological features such as swallow holes are recorded in Cooper's-Lot and Owen's and Bigg's-Lot. There is a cave marked on the 1st Edition OS six-inch map at the south-western edge of Hughes'-Lot East near its junction with Waller's-Lot: the site is not recorded on later mapping. Locations of stepping stones and fords are first recorded on the 2nd Edition OS six-inch map in Hughes'-Lot East, possibly associated with the Cashel Reservoir on the Dualla Road. On the same map disused limekilns are shown in many townlands such as Farranamanagh, Rathcoun, Rathordan, Spafield and Windmill. The dominant soil type is the grey-brown podzolic which are fertile, well-drained soils ranging in depth from 0.20–0.60 m. It is an excellent soil type for agriculture, in particular horse breeding, for which this area of south Tipperary is renowned for.

ARCHAEOLOGY OF THE CASHEL AREA

Prior to the bypass archaeological excavations little was recorded of Cashel's prehistory, with a few uncontexted finds from around Cashel including a stone axe head, and various artefacts of bronze (axes, javelins / spearheads) and curiously, 262 bronze rings (see Appendix i). No prehistoric settlement sites were recorded – a situation that was to change with the bypass investigations. To the east of Cashel a Bronze Age burial had been discovered in Fussough townland, Dualla in 1933: a stone-lined cist burial containing an urn and human bones was dug up from a sandpit at the western base of the Kill Hills TI053-096 (Waddell 1990, 134; O'Brien 2007, 93–4).

The prehistory of Cashel has emerged slowly from beneath the citadel of the Rock of Cashel, whose mix of ecclesiastical and secular architecture generally dominates all discussion and research. The discovery from the middle of the 19th century onwards of metal artefacts from around Cashel, mainly bronzes such as axes, hinted at prehistoric activity in the area (Shearman 1852, 203). The recovery of artefacts from the Rock of Cashel summit is recorded from as early as 1849, with a bronze bell being found (Wyse Jackson 1956, 18). Perhaps the first archaeological excavation in Cashel occurred in the 1850's with investigations inside the Round Tower on the Rock (Fitzgerald 1857, 292). This may have been spurred by the establishment of the Cashel Chapter House Museum on John Street by Mr. Newport B. White in 1855. Two publications by his brother Rev. John Davis White listed a range of objects housed in the Museum, many of which were described as being found from around Cashel (Woodworth 1989, 149).

John Davis White included amongst the museum collection a large helmet [and human bones] found in Farranavarra, north-east of Cashel, possibly associated with the 1170's battle between the Irish and Anglo-Normans (Davis White 1892, 12). In his history of Ireland Giraldus Cambrensis described earthworks being thrown up near Cashel during a battle between the Anglo-Normans and Irish – *As [Raymond le Gros] was advancing towards Cashel...he heard that the men of Thomand had...come to block his path in the pass of Cashel. By laying down broken branches of trees and digging trenches they had greatly broken up a terrain already naturally difficult, and had also built a very strong palisade right across the path...the stockade was completely broken down and destroyed, not without great loss of life among the defenders, and they opened up a path with their swords, and then enlarged it* (Scott and Martin 1978, 161–3). The location of this ancient pass of Cashel is still unknown. Davis White also reported on the discovery of human skulls and bones in Doon

Fort, Farranamanagh [TI060-082], possibly associated with the Desmond Rebellion of 1581 (Davis White 1866, 46–7).

Following in the footsteps of Davis White a later cleric, Rev. Robert Wyse Jackson began recording antiquities around Cashel's hinterland in the 1950's, and some of the objects he discovered are listed in Appendix i (Wyse Jackson 1956a, 21). Cashel's Anglo-Norman moated sites were included in Barry's seminal study of this monument type in the 1970's, including the Boscabell moated site TI061-027 (Barry 1977). These and the other rural sites around Cashel were visited and listed as part of Reynolds's 1975 survey of Tipperary South Riding, followed by Cahill's 1982 study of the barony of Middlethird, as part of an unpublished Master's thesis for UCC. Local historians such as A. Finn, P. J. Davern, J. Knightly, M. 'Bob' O'Dwyer and E. Dalton have over the years lectured and occasionally published about Cashel (see Moloney 1994).

Prior to the bypass excavations in 2003 no discoveries of Mesolithic sites had been made in the Cashel area – the nearest such activity was represented by the uncontexted flints found at Ballybrado House, near Cahir (Woodman & Finlay 2001, 189); a Mesolithic date from the Bronze Age site of Curraghatoor, Co. Tipperary is considered unreliable (Cleary 2007, 39); a single Mesolithic macro flint was found in a medieval context in Toureen Peakaun near Cahir (Ó Carragáin 2011, 341–2) while a possible Mesolithic object, a single retouched jasper point from Chancellorsland, Co. Tipperary is paralleled with objects from the later Mesolithic site at Ferriter's Cove, Co. Kerry (Doody 2008, 329).

Cashel did not feature as a place of recorded Neolithic activity with no megalithic monuments nor house sites known. Only three flints were retrieved from the Rock of Cashel excavations in the 1990's – no further details are known on these objects at present (www.homepage.eircom.net/~dunamase/Dunamase.html) There are a number of undated megalithic structures around Clonoulty and Hollyford north-west of Cashel, recorded by the Archaeological Survey of Ireland. The nearest megalithic tomb is the portal tomb at Lissava TI075-045 near Cahir, *c.* 18 km south of Cashel. In Rathcoun townland south-west of Cashel four undated barrows TI060-107007–TI060-107010 and one unclassified cairn TI060-107011 are recorded clustered together.

A number of the metal artefacts now in the National Museum of Ireland have been assigned in the Early Bronze Age period (Grogan 2005, Fig. 3.1–3.4, 24–29) – see Appendix i below. Recently three standing stones have been identified north-east of Cashel and are now RMP sites: Palmer's Hill TI061-052, Corralough TI061-053 and Ballyknock TI061-054 – these may date to sometime in the Bronze Age and significantly are located along the

prominent Ballyknock ridge, as is a newly discovered ploughed-out *fulacht fia,* overlooking many of the N8 Bypass prehistoric sites (O'Brien 2003 17–26; O'Brien 2006, 15–23; O'Brien 2007, 87–96; O'Brien 2009a, 72–4). Other recent discoveries around Cashel have been made from field walking including further ploughed-out *fulacht fia* in Ballinamona (two sites), Ballinree (one site), Carron (two sites), Gortmakellis (one site), Kilscobin (one site) and Newtown (eight sites) (O'Brien 2008, 73–82), and artefacts such as a thumbnail scraper from Ballinamona, worked flint from Boscabell and Kilscobin, slag from Ballyknock, stone spindle whorls from Ballykelly, George's-Land and Ballinamona respectively, and a hammer stone from Ballinree and George's-Land (O'Brien 2003a, 48–52; www.facebook.com/rathnadrinna). These discoveries have been incorporated into the relevant final reports.

In later prehistory high status activity in the wider area is well represented; the discovery of two Late Bronze Age gold rings at Ardmayle, beside the River Suir and dated to the late 13th – early 12th centuries BC (Cahill 1989, 146), a Late Bronze Age Class IV sword from Aughnagomaun dated *c.* 700 BC (O'Brien 2007, 89–90), and a gold reel containing small gold balls (NMI W306) recorded as being found from Cashel (Cahill 1995, 66). The discovery of the Aughnagomaun sword is significant as earlier Middle / Late Bronze Age evidence was found in the same townland at (E2361) on the M8 North Project (Moore *et al* 2009, i). The lack of Bronze Age settlement sites was highlighted by Doody (1997, 94).

Iron Age Cashel was best represented in heroic literature and with very occasional archaeological discoveries: the Clonura leather shield, from *c.* 20 km north-east of Cashel. However recent excavation in advance of development has identified both potential and definitive Iron Age sites: the discovery of a blue glass bead in Deerpark (Sherlock 2008, 350) may point to Iron Age activity and in the wider Cashel area a possible ritual site in Knockgraffon. The latter site consisted of an arc of eight postholes dated to 380–50 cal. BC (SUERC–25889) while an internal posthole to the arc was contemporary, dated to 380–90 cal. BC (SUERC–25890). Artefacts recovered included unidentified prehistoric pottery, a polished stone axe, three highly polished stones, two copper-alloy fragments and cremated bone (MacLeod 2012, 200–1).

Although Cashel was located on the south-eastern periphery of the Discovery Programme's North Munster Project nevertheless its inclusion saw a number of sites traditionally and locally classified as ringforts re-classified as prehistoric. Upstanding monuments such as Camus TI060-028 [classified as a ringfort on www.archaeology.ie], Carron / *Rathnadov* TI069-002001 [also classified as a henge], Knocksaintlour TI060-179,

Lalor's-Lot / *Rathnadrinna* TI061-089001 and Windmill TI061-072 were classified as hilltop enclosures (Grogan 2005, Fig. 7.6, 116). A number of other monuments perhaps could be added to this list; Ballyknock TI061-008 due to its very prominent location at over 180 m OD, Hughes'-Lot East enclosure 05E0671 (143 m OD), Rathordan TI061-074 (140 m OD), and the multi-ramparted Ballinree TI060-110 are worthy of future study. Based on current evidence the nearest hillfort to Cashel is Kedrah TI075-040, located on the eastern side of the River Suir near Cahir, *c.* 16 km south of Cashel. The only definitive crannog in south Tipperary is recorded from Marhill TI069-072 just south of Rockwell College. Significantly this site is located in the same townland as a Middle Bronze Age site (E2269) and Medieval sites (E2124 & E2268) discovered on the M8 Cashel to Mitchelstown Road Project (see below).

The *Dhuvcloy* earthwork TI061-022 (road / hollow-way) in Charterschool Land TI061-022 has recently been associated with kingship processional rites (Gleeson 2012). In the extents of the *Lands of Monecurialy* of 1688 the highway from Cashel to Deansgrove was mentioned as the *blacke ditch* commonly called the *Doocly* (Davis White 1863, 5). Another road TI060-025 which serves as the townland boundary between Farranamanagh and Rathcoun is now classified as a redundant record (www.archaeology.ie/NationalMonuments/Flex/Viewer/). However on the 1st Edition OS six-inch map the boundary is shown as *Boheragaddy* and a much earlier reference and description of *Bothar Gadie*, 'a double-ditched road (*a biffosario lapideo*)' is found in an Inquisition taken at Clonmel in 1553 (Curtis 1941, 15). In the same source another road called *Botherewolyngyhy* has been equated with Windmill (www.logainm.ie).

Exotic material is represented by the Roman-period occultist's stamp from Spital-Land in Golden, *c.* 7 km west of Cashel (Bateson 1973, 74), and the Roman-type fibula—a dolphin brooch (Type H)—the earliest datable find from the Rock of Cashel (Cahill 1982a, 101). The evidence of international trade is further represented by Romano-British pottery sherds and Bii amphorae sherds from the Rock of Cashel; the Bii amphorae were also found at Derrynaflan *c.* 15 km north-east of Cashel (Kelly 2010, 59–60). Other well-known objects from Cashel include bronze bells, a silver brooch (decorated with Scandinavian thistle design from the late Norse period), a gilded copper crozier-head (set with turquoise and sapphire), the Kennedy-Crux Crozier, the silver-gilt Cashel Pyx, and various chalices and seals (Wyse Jackson 1956, 18–20; see Appendix i). A rare zoomorphic pennanular brooch dated to *c.* 600 AD was found in *Loughnafina*, west of Cashel town (Henry 2000, 200–1).

Early medieval Cashel is well attested in historical sources with the dominance of kings on the Rock under *Éoganachta*, *Uí Briain* and *Meic Carthaig* dynasties (see Historical Background below; Hodkinson 1994; Collins 1997; Gleeson 2012; Gleeson 2014). In Rathcoun a complex of ecclesiastical sites include a church TI060-107002, recorded as *(site of) Templemobee* [Mobhi], the unclassified religious house TI060-107003 *(site of) Monastery*—the only monastic site marked around Cashel—and holy well TI060-107004. Rathcoun and Templenoe are two townlands south-west of Cashel that preserve the word 'temple' in their name.

The plethora of ringforts and possible *Óenach* sites in the region point to a vibrant early medieval hinterland. Some of the forts around Cashel are recorded in historical sources. In the *Life of Saint Declan of Ardmore* a stone fort called *Rath na nIrlann* is specifically identified as being on the western side of Cashel (Power 1914, 28) – this fort may equate with Ballinree TI060-110. *Lis na nUrlann* (location unknown) is recorded in the Yellow Book of Lecan as being associated with the twelfth-century inauguration of the kings of Munster (Fitzpatrick 2004, 178–9). King Brian Uí Briain is recorded as fortifying Cashel *c.* 995 (AI) - this annalistic reference may not be restricted to fortification of the acropolis itself. King Muircheartach Uí Briain had a house at Cashel *c.* 1091(AFM) and within 10 years had handed over the Rock to the church in 1101 (Bracken & Ó Riain-Raedel 2006). Cormac's Chapel, with its' renowned Romanesque architecture was consecrated in 1134 (Ó Carragáin 2010). Although the OPW-funded excavations of the early 1990's on the Rock still remain unpublished, two of the burials excavated in Area 1 have been dated by the *Mapping Death Project* to cal. AD 1029–1155 and cal. AD 1033–1155 (Gleeson 2013, 22). These burials are contemporary with activity at two of the bypass sites: oats from the lower fill of a cereal-drying kiln in Boscabell (Site 19, 03E0426), and a single adult femur displaying trauma, from the upper levels of the Hughes'-Lot East bivallate fort (Site 25ii, 03E0730); see respective final reports.

In the Fiants of the Tudor Sovereigns, under Elizabeth I 1576 the *'high rathe to the north*' [Ballyknock?] and Lepers Hospital [Windmill] are listed amongst local names around Cashel (Fiants 1994, 485). In a description of the lands of James Boiton recorded in the Calendar of the Patent and Close Rolls Elizabeth I 1594–6 local names such as '*High Rathe on the east*' and '*the lands of Asmon, otherwise Boiton Rath*' [Boytonrath] are recorded (Morrin 1862, 392). Could the '*High Rathe on the east*' either be referring to one of the Ballyknock forts TI061-008 or else to the Hughes'-Lot East enclosure [05E0671], (see below)? In the Patent Rolls of James I, Pat. 7 *c.* 1610 the following entry for the Windmill

area is very informative – '*the stone house, towns and lands of the Windmill, Fleming's Rath, and Parkinigrogory in the southern part of Cashell*' (IMC 1966, 146). Could *Fleming's Rath* be Windmill hilltop enclosure TI061-072?

The archaeological inventory for South Tipperary has been updated and new data added to RMP sites around Cashel, see www.archaeology.ie. A recent rural excavation unearthed evidence of a ploughed-out ringfort / enclosure at Hughes'-Lot East (Hurley 2005, 348). Significantly, this site was located on a hillock to the south-east of the town, and its discovery suggested every such elevated location around Cashel was utilised as some form of defended settlement.

The last 20 years witnessed profound development changes in and around Cashel town itself, with a corresponding increase in the number of licenced archaeological excavations taking place (Hughes & Ó Droma 2011; Moloney 2013). Despite the large number of investigations little in the way of pre-13th/14th century AD material has come to light, equally compounded by a lack of publication. One of the more significant medieval excavations was that in Friar Street in 1998 (O'Donovan 2004). New discoveries are still being made in Cashel town: a medieval carved head in the Dominican Friary (O'Brien 2010) and, a carved capital, probably from the Franciscan Friary was found built into a wall on the Dualla Road in Hughes'-Lot East (Hughes 2011). The medieval town itself continues to be a focus of research (Slattery 2007; Hughes & Farrelly 2009; Hughes 2011a; O'Doherty 2012 & O'Brien, N. 2013). The most recently published excavations in the town—numbering three—revealed no archaeological features and, remarkably, no artefacts of any nature (see accounts in Bennett 2010).

A number of Anglo-Norman moated sites are recorded around Cashel (Barry 1977), including an elevated example at Windmill TI061-167 and one at Boscabell TI061-027, the archaeological zone of potential of which was investigated (Sites 18–20). Gortmakellis tower house TI061-011 is a fine example of a five-storey late medieval structure, and the bypass was designed to avoid all impacts on this castle and its' environs.

Recent NRA Excavations Around Cashel

From 2005–7 archaeological discoveries around rural Cashel greatly increased - south of Cashel as far as the county boundary with Limerick on the M8 Cashel to Mitchelstown road and north of Cashel as far as the county (and provincial) boundary with Kilkenny on the M8 Cullahill to Cashel road. These excavations revealed sites containing multi-period activity similar to that found on most of the Cashel excavations too.

The following list summarises the archaeological excavations made south of Cashel on the M8 Cashel to Mitchelstown Road Project, final reports for which were produced in 2007 (all townlands are in Co. Tipperary unless otherwise stated).

Neolithic sites - Suttonrath (E2128), Caherabbey Lower (E2266), Loughfeedora (E2292) & Caherabbey Upper (E2298)

Early Bronze Age sites - Ballylegan (E2265), Ballydrehid (E2267), Cloghabreedy (E2273), Dogstown (E2288), Dogstown (E2289), Templenoe (E2290), Racecourse Demesne (E2297), Caherabbey Upper (E2298), Caherabbey Upper (E2299), Carrigane (E2303 Co. Cork) & Brackbaun (E2338 Co. Limerick)

Middle Bronze Age sites - Killemly (E2126), Suttonrath (E2128), Ballydrehid (E2267), Marlhill (E2269), Knockgraffon (E2270), Knockgraffon (E2271), Cloghabreedy (E2273), Cloghabreedy (E2274), Shanballyduff (E2275), Dogstown (E2289), Clonmore North (E2294), Raheen (E2295), Lissava (E2296), Caherabbey Upper (E2299), Carrigane (E2303 Co. Cork), Brackbaun (E2306 Co. Limerick) & Brackbaun (E2339 Co. Limerick)

Late Bronze Age sites - Killemly (E2126), Suttonrath (E2128), Ballylegan (E2265), Ballydrehid (E2267), Knockgraffon (E2270), Cloghabreedy (E2274), Loughfeedora (E2292) & Caherabbey Upper (E2299),

Iron Age sites - Killemly (E2126), Ballylegan (E2265), Caherabbey Lower (E2266), Ballydrehid (E2267), Knockgraffon (E2270) & Knockgraffon (E2272),

Medieval sites - Marlhill (E2124), Marlhill (E2268), Suttonrath (E2127), Ballylegan (E2265), Knockgraffon (E2271), Tincurry (E2293) & Brackbaun (E2339 Co. Limerick)

Post Medieval sites - Loughfeedora (E2291) & Cloheenafishogue (E2302).

The following list summarises the archaeological excavations made north of Cashel on the M8 Cullahill to Cashel Road Project, final reports for which were produced in 2010 (all townlands are in Co. Tipperary unless otherwise stated):

Neolithic sites - Borris (E2491), Fennor (E2384) & Islands (E2388, Co. Kilkenny)

Late Neolithic sites - Gortmakellis (E2816)

Early Bronze Age sites - Borris (E2378), Borris (E2491), Inchirourke (E2383), Fennor (E2384), Fennor (E2385), Islands (E2386, Co. Kilkenny), Islands (E2388, Co. Kilkenny) & Warrenstown (E2390, Co. Kilkenny)

Middle Bronze Age sites - Parkstown (2368), Rathcunikeen (E2372), Borris & Blackcastle (E2374), Borris (E2375), Borris (E2376), Borris (E2378), Borris (E2379), Inchirourke (E2383), Islands (E2386, Co. Kilkenny), Islands (E2387, Co. Kilkenny), Islands (E2389, Co. Kilkenny) & Foulkscourt (E2391, Co. Kilkenny)

Late Bronze Age sites - Aughnagomaun/Ashhill (E2361), Ballydavid (E2370), Coolcroo (E2818), Borris (E2376), Inchirourke (E2382), Islands (E2386, Co. Kilkenny), Islands (E2388, Co. Kilkenny), Islands (E2389, Co. Kilkenny), Foulkscourt (E2391, Co. Kilkenny) & Glashare (E2394, Co. Kilkenny)

Iron Age sites - Coolkip (E2362), Coolkip (E2363), Ballydavid (E2370), Borris (E2376), Inchirourke (E2382) & Glashare (E2394, Co. Kilkenny)

Early Medieval sites - Parkstown (2368), Ballydavid (E2370), Borris (E2376) & Borris (E2491)

Late Medieval sites - Moycarky (E2365), Moycarky (E2366), Moycarky (E2367), Parkstown (E2368), Borris & Blackcastle (E2374), Borris (E2376) & Inchirourke (E2382)

Post Medieval sites - Borris & Blackcastle (E2374)

The results of some of these excavations are incorporated into various Cashel final reports, can be viewed at www.nra.ie/archaeology and see McQuade (2009, 2, Table 1.1). The apparent lack of Mesolithic discoveries on either of these major road projects was mirrored on earlier infrastructure projects in south Tipperary: the Gas Pipeline of 1981–2 (Cleary 1987, vii), the Gas Pipeline of 1986 (Gowen 1988, vii), the Lisheen Mine Project 1996–8 (Gowen 2005, 61), and more recently again from the research excavation at Curraghatoor (Cleary 2007, 39). Clearly then, the hinterland of Cashel, where four townlands spread across the bypass produced Mesolithic material and/or radiocarbon dates, featured significantly in the movement of both people and materials during the Mesolithic. This movement was in no small part facilitated by Cashel's closeness to the River Suir.

Recent Geophysical Investigations around Cashel

Between 2009–12 a number of research-led geophysical surveys were conducted on a number of sites in and around Cashel. In 2009 and 2010 Earthsound Archaeological Geophysics Ltd undertook geophysical surveys at Rathnadrinna fort TI061-089001 and TI061-089002 in Lalor's-Lot. This work revealed a complex multi-period site, with evidence of large-scale earthworks predating the known fort (O'Brien *et al* 2011, 26). In 2011 Earthsound undertook a geophysical survey at Hughes'-Lot East (Site 25ii, 03E0730) in order to identify the full

extent of the Early Medieval ringfort beyond the CPO (Bonsall 2012). The western edge of the ringfort was identified and the results have been incorporated into the final report for that site (see 03E0730). A survey was conducted in the fields north of the Rock of Cashel in St Patricks Rock townland in 2011 (Gleeson 2014) and in the grounds of Cashel Palace Hotel in 2012 (Gimson & Regan 2012). Further research work in 2011 and 2012 centred on Windmill Hill sites TI061-072, TI061-073 and TI061-167 by Earthsound Archaeological Geophysics, UCC and the University of Bradford / NRA—identifying archaeological features—some of which may be associated with the activity discovered on Sites 31–36i (Gimson 2012). These results are incorporated into the various Cashel final reports.

Recent Research Excavations in Rathnadrinna Fort (TI061-089001), Lalor's-Lot, Cashel

Recent excavation funded by the Royal Irish Academy since 2012 has revealed multi-period activity at this site. The fort was classified as a hilltop enclosure (Grogan 2005, Fig. 7.6, 116), and evidence of prehistoric occupation on the hillside has been dated to the Early Bronze Age by the recovery of a chert arrowhead of the period. A large linear ditch predating the fort ramparts was constructed sometime in the Bronze Age period or earlier: by the Late Bronze Age period the ditch was being infilled and willow charcoal from these depositions were radiocarbon dated 748–405 cal. BC (UBA-24977), and 771–485 cal. BC (UBA-24975) respectively. The Early Medieval period is also represented on site in the form of multiple roundhouses, yards and a non-ferrous metal-working centre. A copper alloy/lead stud mount from a house-shaped shrine, inlaid in gold in a design of four entwined beasts/snakes surrounding the centre was found within the fort. This *ex situ* find has been stylistically dated to not later than the 8th century AD. Carbonised oat from the basal fill of a cereal-drying kiln discovered outside the external fort bank was radiocarbon dated cal. AD 777–980 (UBA-24976). Hazelnut found within lens of charcoal-rich clay in the central fort ditch was radiocarbon dated cal. AD 890–991 (UBA-24974). The preliminary findings from Rathnadrinna suggest the hillside had widespread prehistoric occupation—similar to Windmill hill—with the extant fort dating from at least the 7th century AD onwards (O'Brien 2014, 382–7). These results have been incorporated into the Cashel Bypass final reports where applicable.

Appendix i: Catalogue of objects from Cashel in the National Museum of Ireland

Object: Copper alloy harness mount
NMI No: 2004:178
Find-spot: Ballytarsna
Description: Copper alloy harness mount found by Mr. Alfie Coyle in a potato field on the southern side of the old N8 road, near the junction with Killock Quarry.

Object: Medieval pot sherd
NMI No: 2004:146
Find-spot: Rock of Cashel, surface find at exterior base of Cathedral south wall
Description: Curved pot sherd probably belonging to a medieval vessel. The outer surface of the sherd is glazed. This glazing is green in colour with random dark green and brown dots. On one area of the outer surface of the sherd, there are traces of five incised lines. Max L 5.25; max W 3.28; T 6.90

Object: Socketed iron axehead
NMI No: 2002:88
Find-spot: St. Patrick's Rock, garden of Mr. Dinny O'Brien
Description: Iron axehead with modern iron spike thru the shaft hole. The axehead has a widely splayed blade the sides of which curve inwards towards the shaft hole. This is triangular in shape and folds back to form the perforation to take the handle. In poor condition. Max L of axehead 13.15; W of blade10:00; max T of blade, max 2.1

Object: Copper alloy ferrule
NMI No: 1992:29
Find-spot: Garden in Dogstown, New Inn
Description: Copper alloy ferrule, decorated bronze mount

Object: Wood
NMI No: 1984:107
Find-spot: Curraghtarsna, Cashel
Description: Trough of *fulacht*, reused from a dug-out canoe. Excavated timber C14 dated to 3120_35 BP (GrN 12618)

Object: Bronze spearhead or javelin head
NMI No: 1968:285
Find-spot: Cashel
Description: Rounded blade with ornamental deep grooves close to the ridge of the socket, broad ribbon loops on the large squat socket. l. 6.4cm, l of loop 1.5cm, w of loop 2.1cm, diameter of socket mouth 2cm

Object: Bronze spearhead or javelin head
NMI No: 1968:282
Find-spot: St john Baptist Cashel
Description: Bronze spearhead, socketed, looped, with bevelled edges on the blade and decorative ribbing. Conical socket. Loops are lozenge-shaped and placed midway between blade and mouth of socket. l.11.3cm, l of blade 6cm, w of blade 3.5cm, l of loop 1.8cm, diameter of mouth 1.9cm

Object: Iron spike
NMI No: 1953:9
Find-spot: Hummocky' field near Ballysheehan Motte-and-Bailey
Description: Iron spike

Object: Fragment of an iron horseshoe
NMI No: 1953:10
Find-spot: Hummocky' field near Ballysheehan Motte-and-Bailey.
Description: Fragment of an iron horseshoe

Object: Five medieval pottery sherds
NMI No: 1953:11–5
Find-spot: Hummocky' field near Ballysheehan Motte-and-Bailey
Description: Five medieval pottery sherds

Object: Bronze spearhead
NMI No: 1938:8589
Find-spot: Cashel vicinity
Description: Bronze spearhead

Object: Socketed bronze axehead
NMI No: 1937:3678
Find-spot: Cashel vicinity
Description: Socketed bronze axehead

Object: Silver seal matrix
NMI No: 1912:59
Find-spot: Co. Tipperary
Description: Matrix of seal silver with a green stone set inside. The device on the stone is a sea horse. The legend reads S.IOKIS-CASELL-ARCHID. The matrix was formerly in the possession of Sir William Betham. It has been in the RIA collection for many years. The seal measures 1 1/6inch x 15/16inch.

Object: Stone adze
NMI No: 1909:33
Find-spot: Near Cashel
Description: Of very unusual form, of close grained hard black stone. It measures 9 & 1/8 in length and 2 ½ in breadth. It has a label gummed on which reads "ancient Irish stone adze found at Cashel Co. Tipperary."

Object: Casts of Cormac's Chapel north doorway
NMI No: 1911:5
Find-spot: Rock of Cashel
Description: Casts of Cormac's chapel north doorway also arcading from interior and side of ornamented stone coffin.

Object: Bronze axehead
NMI No: 1892:49
Find-spot: Near Cashel
Description: Socketed celt. Bronze looped cutting edge curved socket fractured filleted near mouth. Extreme length 2 1/4in. greatest width 1 7/8in. external diameter at mouth of socket 1 ¼in.

Object: Copper axehead
NMI No: 1881:133
Find-spot: Dundrum, found in 1842

Description: Copper, broad and flat, surface rough, narrow and straight large gaps in one end of cutting edge, workmanship very rude. Extreme length 6 ½inches thickness at centre ¼inch, greatest width 4 inches, width at narrow end 1 ¾inches

Object: Bronze axehead
NMI No: 1880:15
Find-spot: From Cashel
Description: Socketed celt, bronze, brownish, patinated, looped, cutting edge curved, mouth if socket nearly round portion battered by hammering, length 2 7/8in. width at cutting edge 2 ¼in. greatest external diam. Of socket 1 ½inch

Object: Silver paten
NMI No: 1880:98
Find-spot: Found when digging a grave in burial ground adjoining Cormac's Chapel, Rock of Cashel
Description: Silver circular and thin rim broad and flat centre portion slightly concave cracked in several places part of rim detached diameter 4 ½in width 5/8ths inch length detached portion 3 11/16ths inches wt. 1oz. 9dwt. 11gr.

Object: Silver coin Edward II
NMI No: 1875:122
Find-spot: North-east part of Cathedral, Rock of Cashel
Description: Edward II, found with Bronze pin No. 121

Object: Bronze pin
NMI No: 1875:121
Find-spot: North-east part of Cathedral, Rock of Cashel
Description: Pin bronze, stem tapering to a fine point and slightly diminishing towards head, on upper half of its length ornamented with diagonal hatchings, head formed by two horse's faces turned outwards, length 3 5/8inches, and greatest thickness of stem more than 1/8inch

Object: Copper and silver coins
NMI No: 1877:16
Find-spot: Cashel
Description: Copper square Youghal Token 9/16 inch square.
Silver Mecklenburg shilling

Object: Iron key
NMI No: 1877:12
Find-spot: Cashel
Description: Iron brown much rusted, pipe in shank, bow semi-oval and attached to shank by two scrolls. Extreme length 3 3/8inches, greatest width of bow 1 15/16inch. Measurement across shank and bit 1 inch

Object: Stained glass
NMI No: 1877:11
Find-spot: Cormac's Chapel, Rock of Cashel
Description: Fragment of stained glass. Greenish with reddish-brown stripes. Portion of latter forming lozenge shaped ornamentation with central circlet of same colour. Pattern similar to that of fresco painting on walls of Cormac's Chapel, in which structure it was found. Greatest length 1 ¾inch, extreme width 1 ½inch

Object: Bell metal portions
NMI No: 1877:10

Find-spot: Cormac's Chapel, Rock of Cashel
Description: Portions of bell metal (2) brownish green, respective measurements 1 ½inch x 7/16inch, and ¾ inch x ½inch

Object: Copper alloy Lion
NMI No: 1877:1
Find-spot: Found in open space between Cormac's Chapel & Cathedral, Rock of Cashel
Description: Brass lion, greenish in sitting posture, rectangular socketed projection in rear of hind legs, base oblong and irregularly rounded in front, height 2 ft 20inches length of base 7/16th inch width 5/8th inch

Object: Glass fragment
NMI No: 1877:14
Find-spot: Cashel
Description: Greenish grey remains of 'bull's eye' on one of the faces. Extreme length 3 1/8inches greatest width 1 ¼inch greatest thickness 5/8inch

Object: Wooden bow
NMI No: R:2470
Find-spot: Near Dundrum
Description: Wooden bow, found in the moat of a square rath near Dundrum

Object: Gold bracelet
NMI No: W307–309
Find-spot: Cashel
Description: Three individual gold bracelets

Object: Gold ball & reel
NMI No: W306
Find-spot: Cashel
Description: Gold ball & reel

Object: Copper alloy bell
NMI No: W2 WK209
Find-spot: Cashel
Description: Copper alloy bell

Object: Bronze rings (262)
NMI No: W232–493
Find-spot: Cashel
Description: Bronze patinated and tarnished. Apparently solid. Annular but one is cut through showing it to be solid. Some are circular in cross-section. Some are regular on the inside and some seem to be rough or unfinished casting. The sizes range from 1.50 external diam with 1.40 internal diam to 2.90cm

HISTORICAL SOURCES

For the historical background to Cashel town and its environs see White (1863: 1866 & 1892), Gleeson (1927), Finn (1930), Bradley (1985), Fogarty (2000), MacShamhráin (2004), Marnane (2007), and more recently Marnane & Darmody (2011). Some key dates in the history of Cashel include:

AD 370 Traditional date of Kings of Munster ruling from Cashel.
448 Traditional date for Saint Patrick's visit to Cashel, and baptism of King Aengus.
580 Cairpre, King of Cashel died.
593 Feidlimid, King of Cashel died.
662 Maenach, King of Cashel died.
666 Cú-cen-Máthair, King of Cashel [& Munster] died.
713 The battle of Carn Feradaig, in which Cormac King of Cashel, died.
742 Cathal, King of Cashel died.
820 Feidlimid, son of Crimthann, took the kingship of Cashel.
821 Artrí, King of Cashel died.
847 The first recorded king-bishop of Munster died in Cashel.
976 Brian Boru was crowned King of Munster.
995 The fortifying [building] of Cashel, Inis Locha Gair, and Inis Locha Sainglenn, and many buildings besides, by King Brian Boru.
1093 Diarmait, son of Tairdelbach Ua Briain, submitted to Muirchertach, i.e. his brother, and they made peace and a covenant in Cashel and in Les Mór, with the relics of Ireland, including the Staff of Jesus, as pledges, and in the presence of Bishop Ua hÉnna of Cashel and the nobles of Mumu.
1095 Cashel [the Rock] was burned [cause of burning unknown].
1101 Muirchertach O'Brien, King of Munster bequeathed the Rock to the church.
1102 Cashel was attacked and burned by the *Éili* of north Tipperary.
1107 Cashel [the Rock] was burned by lighting.
1115 Cellachán Ua Cellacháin of Cashel was slain.
1118 Mael Sechnaill Ua Faeláin was treacherously slain in Cashel.
1127–34 Traditional date for the building of Cormac's Chapel on the Rock.
1130's Benedictine monks settle on the Rock of Cashel.
1141 The bishopric of Cashel was made Metropolitan.
1172 King Henry II of England presided over a synod in Cashel.
1178 Cashel was plundered by the Normans.
1179 Cashel [the Rock] was burned [cause unknown].
1194 Tadc, son of Mathgamain Ua Briain, was put to death by the foreigners in Cashel, despite the protection of the legate Archbishop Ua hÉnne of Cashel and Patrick.
1216 Cashel was designated as a borough town.
1220's References to the old and new *vill* (town) of Cashel survive.
1224–37 Sir David Latimer founded a Leper Hospital of St. Nicholas in Cashel.
1228 King Henry III returned the town to the ownership of the Archbishop, and a Fair was granted.
1243 Foundation of the Dominican Friary of Cashel, north of the town wall.
1265 Foundation of the Franciscan Friary of Cashel, east of the town wall.
1272 Foundation of the Cistercian monastery of Hore Abbey, south of the Rock.
1279 Letters of protection for two years for Adam Stripling, merchant of Cashel, about by the King's licence to go to parts beyond the sea.

1317 Edward Bruce of Scotland visits Cashel during his invasion of the country.
1320 Grant to the bailiffs and worthy men of Cashel, in aid of enclosing the town with a stone wall, that they may take the following customs in the accustomed form for five years from every crannock of wheat, peas, beans and every kind of corn, 1d.
1346 Commission to Adam Preston of custody of the castle of Cashel, during the King's pleasure, with the accustomed fee.
1378 King Richard II confirmed all the privileges of Cashel' Corporation; in Cashel Royal Service was proclaimed.
1378 King Richard II learned that there was no law, justice or good governance in any parts around the town of Cashel, but rather rebellion, extortion, murder, killing, robbery and open war made by the King's Irish enemies and rebels upon that town, so that the provost and commons of that town can scarcely be kept without great relief by the King in this part.
1381 The town of Cashel was situated in the march and was so devastated by invasions of the King's enemies that it cannot support the household of the King's Lieutenant and other officers except in the houses of the Friars Preachers and Friars Minor of that town; and because of the destruction of the surrounding parts where the said friars are wont to receive alms for sustenance, they have scarcely enough on which to live. Order to pay the Friars Preachers 5m as an aid for repairing their church and houses.
1494 The Earl of Kildare, Gerald Mór burned St. Patrick's Cathedral, believing the bishop to be hiding inside!
1540 The religious institutions of Cashel were seized by the English Crown.
1581 During the Desmond Rebellion cattle raids in Cashel result in the deaths of 60 townsmen.
1637 King Charles II of England granted a Charter to the town: it was to be known as '*City of Cashel*'.
1622 Archbishop Miler Magrath of Cashel died.
1641 The town of Cashel was invaded by the O'Dwyer Clan and many English settlers killed.
1647 The Rock of Cashel was conquered by forces loyal to the English Parliament, led by Irish man Lord Inchiquin.
1687 King James II of England granted Cashel a Charter.
1749 The roof of St. Patrick's Cathedral was removed.
1869 Following a Parliamentary inquiry the Corporation of Cashel was dissolved.

Townland History

In the Place Names Database of Ireland the following dates are listed under Monadreela townland; 1243–44, 1280–90, 1297, 1303, 1304, 1306–1309, 1312, 1327, 1360, 1389, *c.* 1400, 1636, 1638 & 1640 (www.logainm.ie). These dates, particularly those pre-dating the 17th century derive from an interpretation of the '*dreela*' elment of the name being associated with the de Druhull family (also spelt Druil, de Drehull, Droyll, Droill, de Droill, Druhill, de Drohuill and Drule), a local name recorded in such sources as the Calendar of Ormond Deeds and Red Book of Ormond. A link with the medieval settlement discovered in Monadreela

was obvious but a critical examination of these primary sources casts doubt on many of the dates listed under the Place Names Database of Ireland being associated with Monadreela.

As Table v below shows the earliest definitive Tipperary connection can be made for John de Drehull in 1297, and the earliest definitive Cashel connection is with Robert Druill in 1308. A number of the other early fourteenth century dates pertain to either Cashel or the general Tipperary area but clearly, the final date was 1312 when John de Druhull was named amongst jurors sitting in Cashel. Is this the same John de Drehull listed in 1297? Those dates from the mid to late fourteenth century, 1327 and after relate only to New Ross, Co. Wexford and Co. Kilkenny. Does this evidence suggest the name de Drehull no longer survived around Cashel by the 1400's? Clearly there were plenty references in the last decade of the 13th / first decade of the 14th century to the family being associated with Cashel and/or the Tipperary area. A study of the family, the land deeds referring to family members and identifying the location of Moyrathbyran, mentioned in the sources would be beneficial research.

DATE	NAME	DESCRIPTION	INTREPRETATION	SOURCE
1243–44	William de Druhull	Listed as a witness	No obvious Tipperary association	COD I 44
1280–90	Adam Druil	Listed as a witness to a Deed, refers to 'a carucate of land in the tenement of Duffrac, lying between the King's highway and the sea on the south of said tenement'	No Tipperary association	COD I 44
1297	John de Drehull	Mentioned	No obvious Cashel association, tentative Tipperary association	COD I 44
1301-02	John Drulle	Received letter re call for army to serve against the Scots	No obvious Cashel association, tentative Tipperary association	CDI 19
[1303]	Johann de Druhull	Johann de Druhull mentioned in the extent of the manor of Nyncheaunlef (Co. Tipperary) concerning lands in Corrayth	No obvious Cashel association	RBO 53
1303	Johanne de Druhull	Johanne de Druhull mentioned in the extent of the manor of Thurles concerning lands in Clonmore and Gortaththy	No obvious Cashel association	RBO 72
1304	Willelmo de Druhull	Willelmo de Druhull mentioned in the extent of the manor of Ballygaueran (Gowran) Co. Kilkenny concerning lands in Kilram	No obvious Tipperary association	RBO 60
1306	W. de Druhull	Willelmo de Druhull mentioned for Moycarky concerning lands in le Mawerie and le Horeston	No obvious Cashel association	RBO 35
1307	Gilbert de Drehul	Mentioned	No obvious Cashel association, tentative Tipperary association	CJR II 334
1307	Gilbert Droyll	Has to attend at court in Cashel along with Stephen Tirry regarding lands at Moyrathbyran	No obvious Cashel association, tentative Tipperary association	CJR II 335
1307	Gilbert Droill	Common pleas at Cork Gilbert Droill named along with Stephen Terry regarding lands at Moyrathbyran which Gilbert now holds, and one tenant Ph. son of Matthew Maunsel. Philip alleged there was an error in the deed. Gilbert did not appear	No obvious Cashel association, tentative Tipperary association	CJR II 394
1308	Gilbert Droill	Mentioned in pleas at Dublin, and previously at Cashel court	No obvious Cashel association, tentative Tipperary association	CJR III 72
1308	J. de Druhull	Mentioned under the lands of Robert Purcell	No obvious Cashel association, tentative Tipperary association	RBO 56
1308	John Droill	At court in Cashel John Droill mentioned as the late husband of Christiana, who held dower lands [tenements] as a gift from John in Moyrathbryan - one messsuage, one mill, one carucate of land, three acres of meadow, one acre of wood and thirty acres of moor	No obvious Cashel association, tentative Tipperary association	CJR III 73
1308	Gilbert de	Gilbert now held the tenements but was a minor. Court	No obvious Cashel association,	CJR III 74

	Droill	made John le Flemeng Gilbert's guardian	tentative Tipperary association	
1308	Robert Druill	Listed under Tipperary (Cashel), suggests he may be a knight	Cashel association	CJR III 76
1308	Gilbert Droyll	Gilbert Droyll listed as a minor. Listed under Tipperary	Tipperary association	CJR III 76
1308	William Droill	Listed under the liberty of Kilkenny William Droill, in his bailiwick with corn in his haggard, twenty acres of wheat and oats worth forty pence an acre	Kilkenny association	CJR III 104
1309	John de Drohuill	'*Robert Wodelok acknowledges that he owes John de Drohuill, knight, two sacks of wool worth twenty marks*'. Listed under Tipperary	Tipperary association	CJR III 133
1312	John de Druhull	John de Druhull named amongst jurors sitting in Cashel	Cashel association	CJR III 257
1327	William de Druhull	'*Final concord made in the King's Court at Kilkenny...before Arnald le Poer, then seneschal of Kilkenny*' - William son of William de Druhull and his wife Burga listed in a deed concerning the manor of Dounmore, location unknown	Kilkenny association?	COD I 254
1360	Thomas Drule	'*Deed of attorney by Thomas Drule, burgess of Rosponte, [New Ross]...*'	New Ross association	COD II 54
1389	John Druyll	Listed as '*rector of Rathbagh*'. Also spelt [Rathbathagh, Rathbough] and located in county Kilkenny	Kilkenny association	COD II 210
*c.*1400	David Drule	Listed amongst individuals in the barony of Shilleloghir in county Kilkenny	Kilkenny association	COD II 351

Table v: Analysis of entries listed for Monadreela in the Place Names Database of Ireland

Civil Survey for County Tipperary 1654–6

In the Civil Survey for County Tipperary 1654–6 the parish of Patricks Rock was described as follows: '*The sd Parish lyeth intirely in the Barony of Middlethird & County of Tipperary. The Tythes of the sd Parish is an intire Viccarage belonging to the Sea of Cashell. The whole Tythes was worth in 1640 £100. The sd parish containeth the severall Townshipps following with their old extent of Irish Acres whereof...Kylscoubine one acre, Georgesland one Acre. Rathdangen three acres; Banadrily one acre, Ballin Knuck five acres. Gort McEllis two acres...Windmill fower Acres...*' (Simington 1931, 219–20).

Monadreela was referred to as Banadrilly (probably "gap of the mire") and itemised with the townland of Clonmore to the north, comprising '*two acres old extent*'. The townlands were together described as comprising 119 Plantation Acres: 60 acres arable, 58 acres pasture and 1 acre of meadow, valued at £5, none unprofitable. The Proprietor in 1640 was '*Walter Sall of Garrane Irish Papist. The sd lands are bounded on the South with Rathdangan in this parish & Ballykunock in this parish, on the West with the sayd lands of Ballykunock in this parish. On the North with GortmcEllis in this parish, & on the east with the lands of Garranemore in this parish. The sd Walter Sall pprietor in fee by descent from his ancestors. The sd lands are wast without impvemt.*' (ibid 223). Although it is impossible to verify, the one acre of meadow may refer to the marshy part of Monadreela beneath Ballyknock hill.

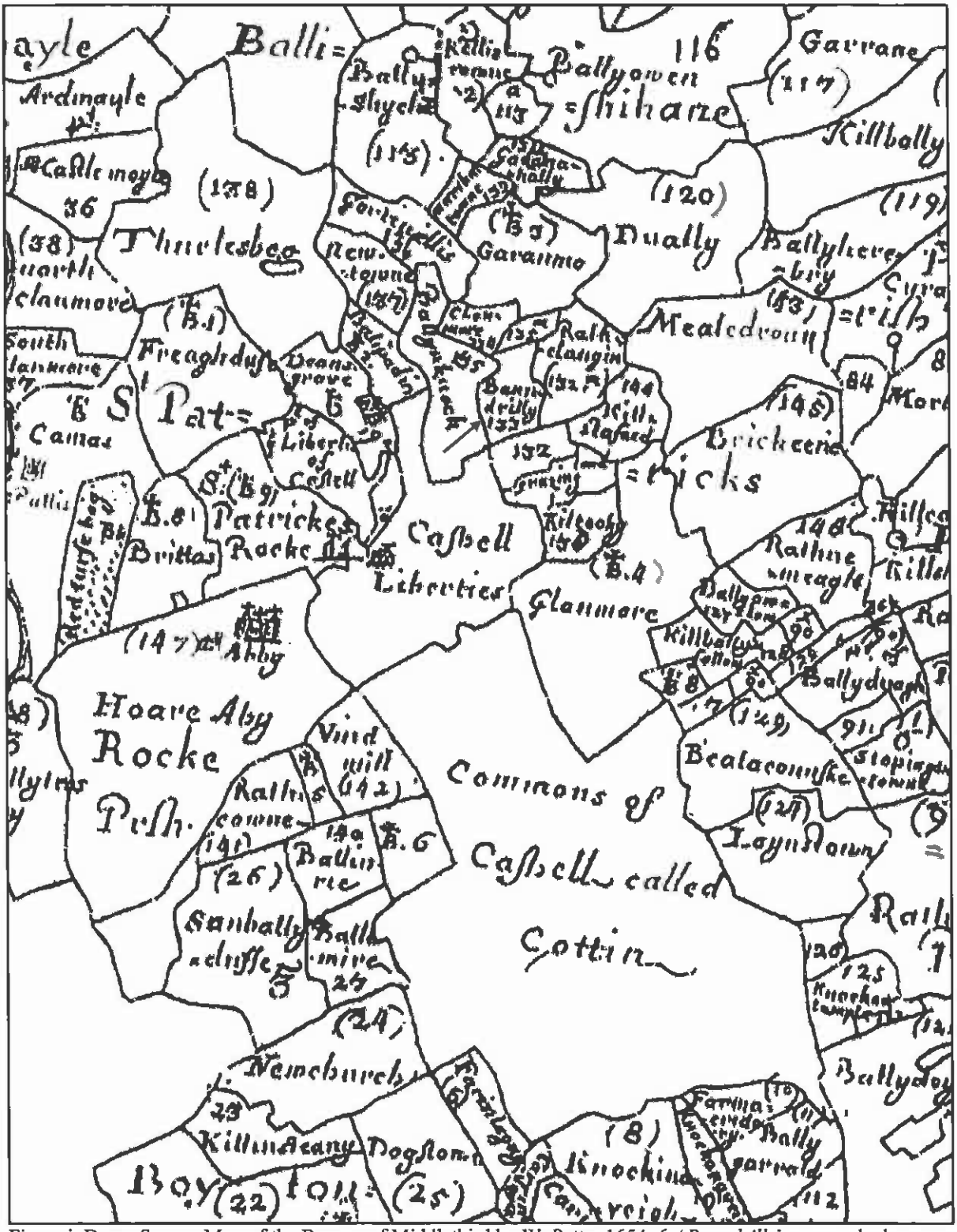

Figure i: Down Survey Map of the Barony of Middlethird by W. Petty, 1654–6. '*Banndrilly*' was marked (133).

Books of Survey and Distribution for County Tipperary

In the Books of Survey and Distribution the following proprietors are listed in 1640 for the townlands in the parish of St. Patricks Rock that were investigated on the bypass:

Proprietor	Townland
Edmond Stapleton, Gortmakellis	Gortmakellis
Walter Sall, Garrane	Bandrilly & Clonmore
John Hanly, Cashel	Kilscobin
Derby Ryan, Cashel	Windmill

Table vi: Extracts from the Books of Survey and Distribution for St. Patricks Rock, 1640 (Marnane 2001)

Walter Sall was a member of the influential Sall family who lived in Cashel (MacCotter 1999). For instance, under the Charter granted to the City of Cashel by James II, 1638 John Sall was named Mayor of Cashel, both Robert and Francis Sall free burgesses, Geofrey Sall merchant and both John Sall Fitz-Geofrey and John Sall Fitz-Walter apothecaries (Finn 1930, 6–7).

Other 17th Century Sources

There are no recorded inhabitants of Monadreela in the Census of Ireland for 1659 (Pender 1939), nor in the Tipperary Hearth Money Records for 1665–7 (Laffan 1911). This may suggest Walter Sall was using the entire lands for grazing animals. In 1666 Monadreela was called *Banedrely / Baunedrilly* (www.logainm.ie).

Smith–Barry Cashel Estate

Much land around Cashel had been granted to the Protestant Erasmus Smith, later of the Smith–Barry estate, for services rendered to the Crown following the Cromwellian confiscations in 1652. One of the descendants, John Smith–Barry inherited these lands in 1755 and Monadreela formed part of the grant. In his analysis of the Smith–Barry Estate, valuable information relating to townlands investigated during the bypass has been recorded by Marnane (2001–2005).

Tenant	Denomination	Acres	Rent p.a.	Tenure
Barnaby Phelan	Gortmakellis, Newtown & Clonmore	260	£79	3L/1740
Wm. Pennefather	Monadreela	73	£18	3L/1729
Richard Lockwood	Windmill & Ballinree	318	£80	3L/1731

Table vii: The Smith–Barry Cashel Estate *c.* 1755. 'Irish acres, 3L = three lives from that date' (ibid 99)

William Pennefather, of the well-known Pennyfather family of Cashel is the only tenant listed for Monadreela and the lands had been in the family since 1729. In 1766 Monadreela was called *Monedrily* (www.logainm.ie).

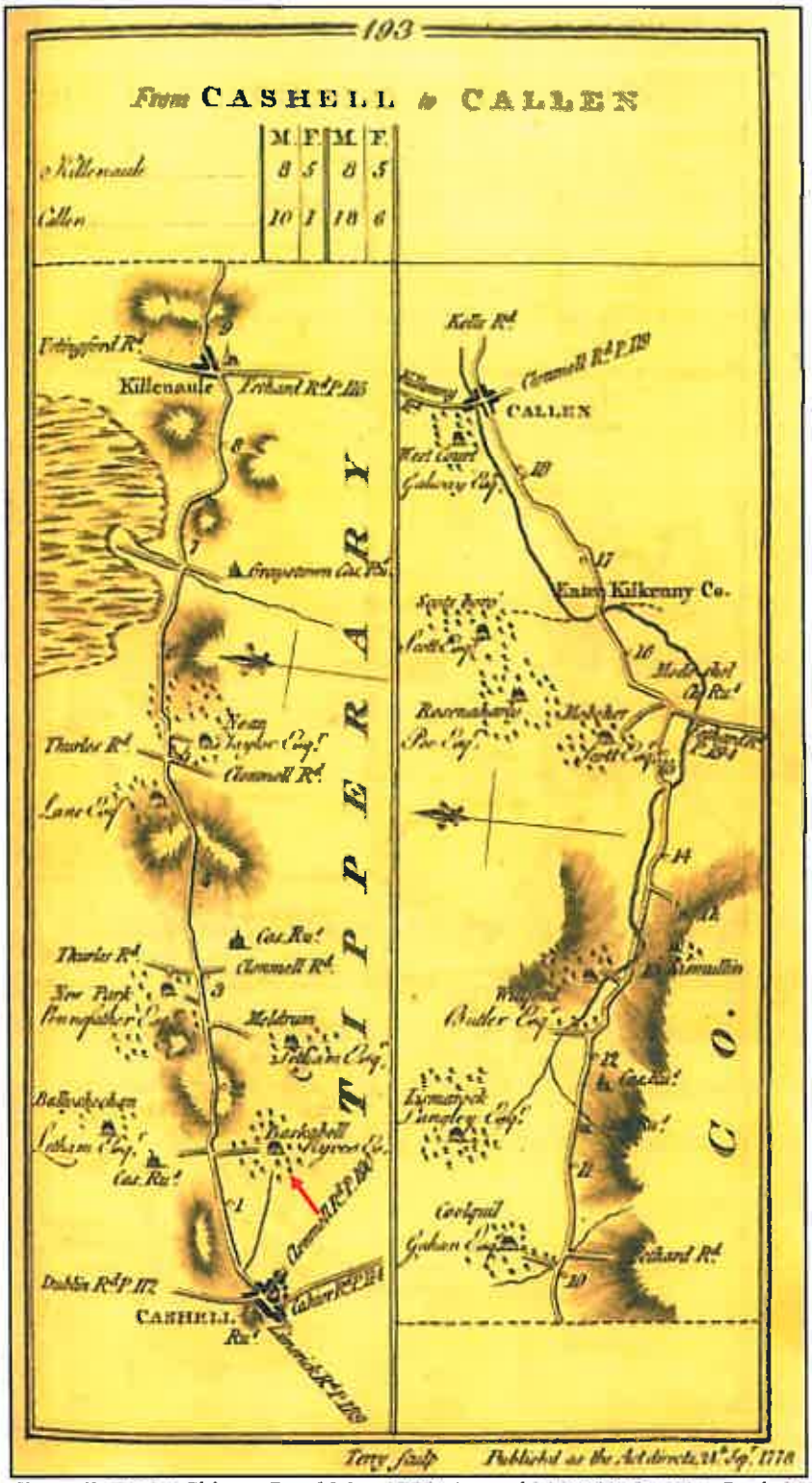

Figure ii: Taylor Skinner Road Map 1778. Around Monadreela only '*Baskabell Ryves Es.*' is marked.

Tenant	Denomination	Rent p.a.
Barnaby Phelan	Gortmakellis	£79
Thomas Pennefather	Monadreela	£72
Sundry tenants	Monadreela	£116

Table viii: Rental of Smith–Barry Cashel Estate November 1813 (based on Marnane 2002, 60–1)

The above rental shows another Pennefather, Thomas, as a tenant of Monadreela along with unnamed tenants. The combined rent per annum on the lands, £188 was very high in

comparison to the rent on lands at Gortmakellis. The rent per annum for Gortmakellis remained £79 from 1755 to 1813, while for Monadreela it increased from £18 rent per annum in 1755 to £188 in 1813. It is unclear why the valuations were so different but it may reflect some of the notorious financial dealings practiced by the Pennefathers sitting on Cashel Corporation, for which much has been written (Finn 1930; Marnane 2007).

The Second Report of the Commissioners of Education (recorded 1824, published 1826) listed a Roman Catholic school in 'Moonadrilla', described as a 'thatched house with mud walls, an income of £10. teacher Mr. James O'Donnell and catering for 40 students' (Moloney 1994, 224, Appendix VII). Unfortunately it is not possible to pin-point this school, although the above description would equate with the archaeological findings on the excavation of Site 14 (O'Brien 2013e).

Tithe Applotment Books for Cashel

In the Tithe Applotment Books for Cashel dating from 1827 although 16 surnames are listed for Moneadrila/Monadula, at least four are duplicate entries (www.titheapplotmentbooks.nationalarchives.ie). Names include Gavin / Gavan, Maher, Ryan, Coonane / Coonan, Smith–Barry, Quishion / Cushion and Keating / Keahry. There is no mention of James O'Donnell and his school; did it no longer exist or had the teacher changed? The Pennefathers are no longer associated with Monadreela either. Smith–Barry, Ryan and possibly Gavin / Gavan [Garavan] were still listed in the Griffiths Valuations of 1850 (see below).

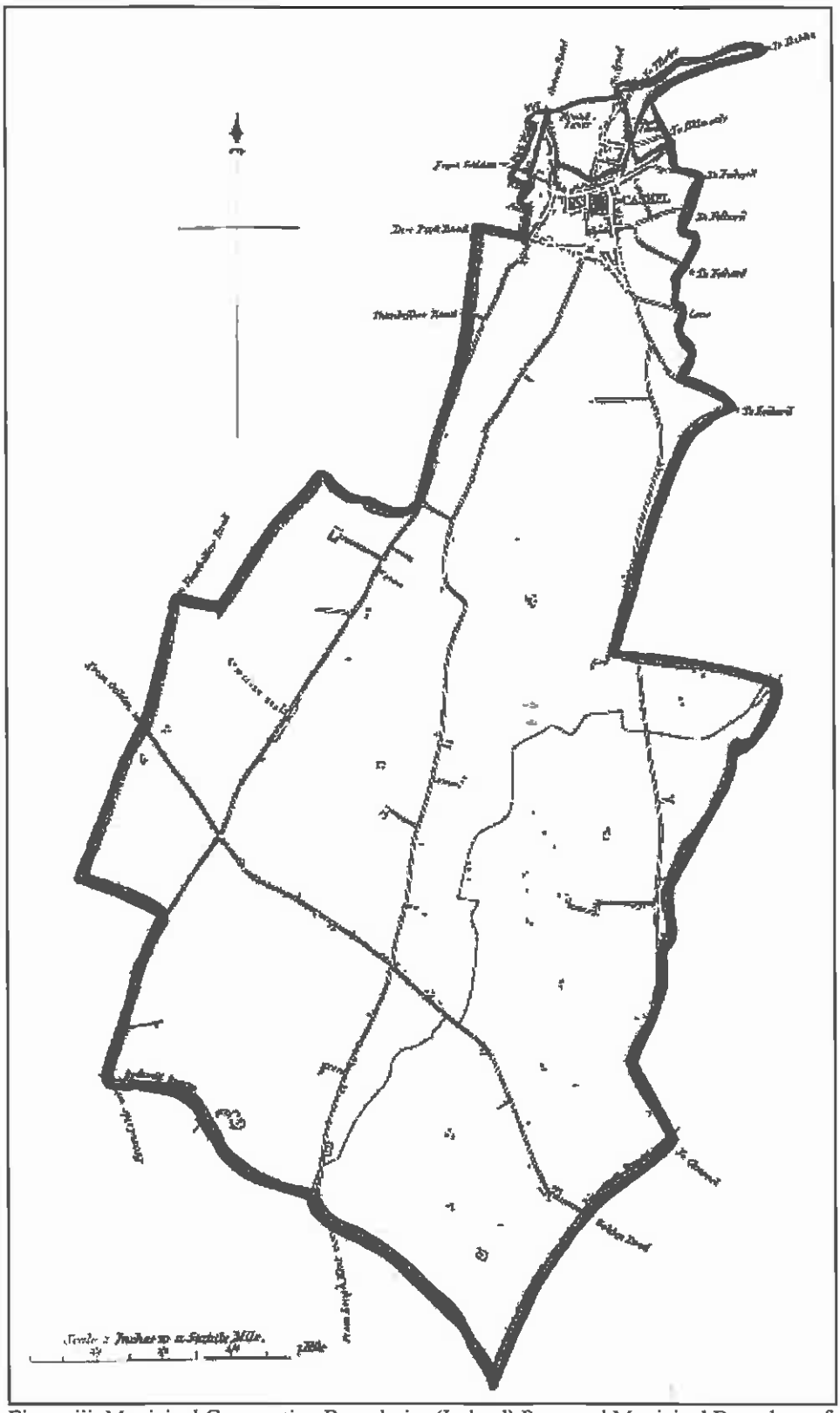

Figure iii: Municipal Corporation Boundaries (Ireland) Proposed Municipal Boundary of the Borough of Cashel, December 1831.

Although Monadreela was located outside the remit of the Corporation, the previous tenants, the Pennefathers had exercised almost autocratic control of Cashel Corporation from the 18th century (Finn 1930, 27).

Ordnance Survey Namebooks for Co. Tipperary 1840

In the Ordnance Survey Namebooks the townland name is given as *Móin na draoile*, the bog of the mire. It was '*on the road from Fethard to the Mail Coach road to Dublin from Cashel & South of that from Cashel to Killenaule and in the Barony of Middlethird. Is all arable and pasture*' (Ó' Flanagan 1930, 137). The name probably derived from the wet valley running north-south from Ballyknock Hill.

Census Returns for 1841 & 1851

These census returns reveal the full extents of the Great Irish Famine in the Cashel area.

Census Year	1841				1851			
Townland	Houses	Male	Female	Tot. Persons	Houses	Male	Female	Tot. Persons
Gortmakellis	14	-	-	95	8	-	-	43
Ballyknock	13	-	-	88	6	-	-	39
Clonmore	4	-	-	23	2	-	-	9
Monadreela	10	35	33	68	2	4	8	12
Boscabell	16	49	48	97	8	23	25	48
George's-Land	1	4	2	6	1	3	5	8
Kilscobin	2	3	5	8	2	2	3	5
Hughes'-Lot East	10	28	33	61	8	21	22	43*
Rathordan	27	102	92	194	18	58	58	116
Waller's-Lot	6	27	14	41	9	31	25	56*
Cooper's-Lot	7	14	18	32	5	15	18	33
Owen's & Bigg's-Lot	5	17	15	32	5	20	13	33
Windmill	20	57	61	118	8	26	16	42
Deerpark	2	6	8	14	1	4	4	8
Farranamanagh	47	160	159	319	34	92	83	175

Table ix: Census Returns for 1841 & 1851. *indicates part included in Cashel Urban District (Dalton 1994, 167–8; Meskell 1987, 254–6)

Such comparative information allows the full impacts of the Famine to be realised at local level. These figures should be treated with caution, however, as Smyth (2012, 13) has recently illustrated the inaccuracies in the 1841 statistics. Townlands like Clonmore and Windmill saw a 50 % or more reduction in the number of houses over the 10 year period represented in the censuses. Monadreela lost eight of its 10 houses and suffered a drastic reduction in population (68 persons reduced to 12). This would have had enormous negative impacts on the locality, both socially and economically. In Monadreela, the remains of the dwelling discovered on adjacent Site 14 may represent one of these mud-walled houses abandoned during the Famine (O'Brien 2013e).

1st Edition OS six-inch map

On the 1st Edition OS six-inch map Monadreela was bounded on the west and north by Ballyknock, on the north-east by Clonmore and Ballymackane, and on the east and south by Boscabell (Figure iv). A farmhouse and smaller out-building was located at the junction with Croke's Lane / Boscabell townland boundary, subsequently excavated as Site 14 (03E0395). The farmhouse was orientated east-west at a slight south-easterly angle; the out-building was separate and to the north-east. Both were set within a rectangular tree-lined field which extended east to intersect with a north-south orientated field boundary, and to the south the plot formed the northern boundary of Croke's Lane. Croke's Lane appeared open on this side although there was a suggestion of a gate near the lane. At the south-western corner of the townland was Ryan's (see below).

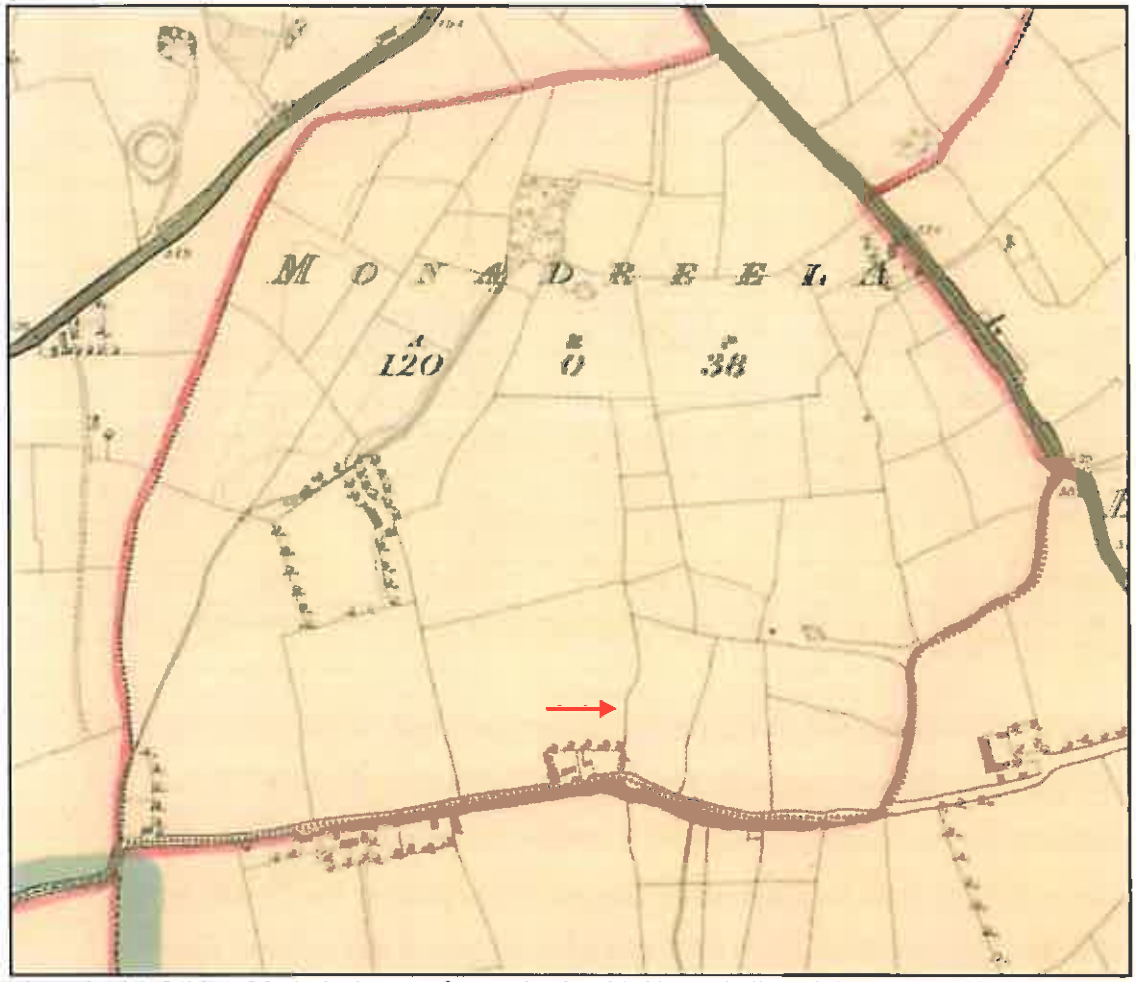

Figure iv: 1st Edition OS six-inch map of Monadreela with Site 13 indicated. Source: www.osi.ie

Primary Valuation of Tenements in St. Patrick's Rock & St. John Baptist Parishes

In the Primary Valuation of Tenements recorded in Griffith's Valuation for South Tipperary taken in August 1850 the following information is of relevance for those townlands investigated on the bypass.

Townland	Acres (roods & perches)	Land £	Buildings £	Total £
Gortmakellis	357 (1 r. 18 p.)	£302 16s	£15 8s	£318 4s
Ballyknock	250 & 27 perches	£200 3s	£10 7s	£210 10s
Clonmore	65 & 15 perches	£47 18s	£4 11s	£52 9s
Monadreela	120 & 38 perches	£68 13s	£2 3s	£70 16s
Boscabell	268 (1 r. 5 p.)	£165 3s	£10 1s	£175 4s
George's-Land	104 (2 r. 5 p.)	£70 8s	£1 2s	£71 10s
Kilscobin	117 (1 r. 16 p.)	£86 2s	£3 4s	£89 6s
Hughes'-Lot East	413 (9 p.)	£680 7s	£140 14s	£821 1s
Rathordan	842 (3 r. & 4 p.)	£848 11s	£37 5s	£885 16s
Waller's-Lot	153	£314 13s	£24 16s	£339 9s
Cooper's-Lot	199 (1 r. 20 p.)	£245 4s	£8 19s	£254 3s
Owen's & Bigg's-Lot	143 & 27 perches	£148 10s	£3 19s	£152 9s
Windmill	299 (2 r. & 31 p.)	£382 15s	£11 5s	£394
Deerpark	152 (3 r. 9 p.)	£276 7s	£35 17s	£312 4s
Farranamanagh	655 (3 r. 10 p.)	£565 16s	£51 5s	£617 1s

Table x: Extract from the Primary Valuation of Tenements in St. Patrick's Rock & St. John Baptist parishes recorded in the Griffith's Valuation, August 1850, listed per total value of land and buildings.

In Monadreela Smith–Barry, William Corboy, James Garavan [Gavin / Gavan?] and Bridget Ryan were listed as tenants: Smith–Barry himself was the Immediate Lessor and held the lands in fee. Only two houses were listed (the same number as recorded on the 1851 census); James Garavan had one acre (3 roods & 22 perches) valued at 19 shillings and buildings at 15 shillings, with a cumulative value of £1, 14 shillings. Bridget Ryan had 20 acres (1 rood & 37 perches) valued at £13, 7 shillings and buildings at £1, 18 shillings, with a cumulative value of £14, 15 shillings. No vacant houses were listed. The total acreage for Monadreela was 120 acres and 38 perches, with land valued at £68, 13 shillings, buildings at £2, 3 shillings giving a total value of £70, 16 shillings. Clearly, there was a drastic reduction in tenant numbers after the Famine.

The Griffith's Valuation map showed James Garavan's holding as No.1, with Ryan's as No. 2. The latter dwelling still survives as a ruin and was known locally within the last 50 years as 'Annie's cottage' (a young girl, Annie Ryan was listed as living in the house in the 1901 & 1911 censuses). There is no record of the school in Monadreela.

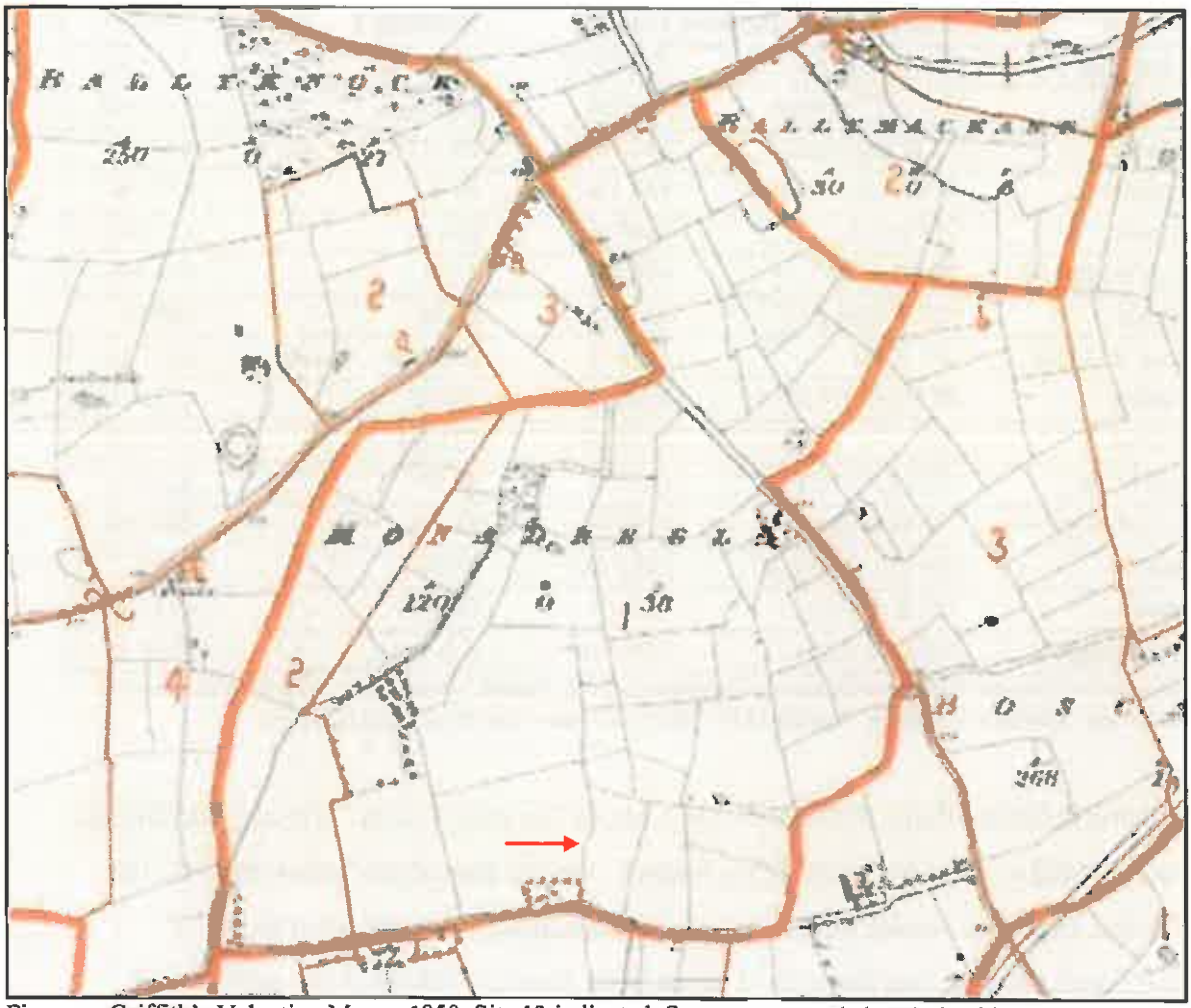

Figure v: Griffith's Valuation Map *c.* 1850, Site 13 indicated. Source: www.askaboutireland.ie

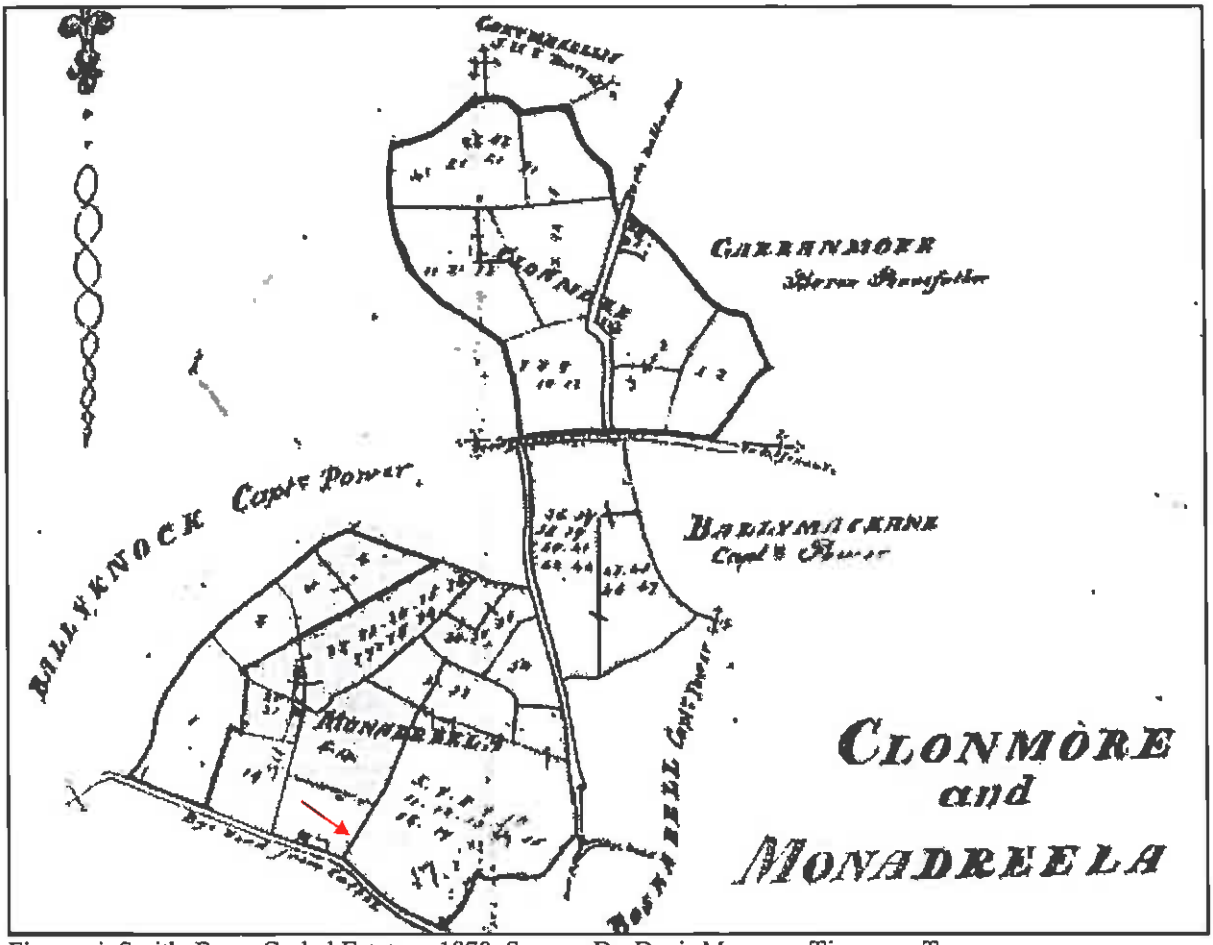

Figure vi: Smith–Barry Cashel Estate c. 1870. Source: Dr. Denis Marnane, Tipperary Town

Figure vi shows a portion of the Smith–Barry Cashel Estate map from *c.* 1870. In Monadreela, Mr. Patrick Phelan is the tenant of Field Nos 5–47, totalling 96 acres (3 r. & 33 p.) valued at £74, 15 shillings & 2 pence, with a rateable value of £37, 15 shillings. As Mr. Phelan does not appear as a tenant on either the Tithe Applotment Books nor on Griffiths Valuation the lands must have changed hands after the 1850s. Parts of the unsettled estates of Mathew Pennefather of Newpark, near Dualla were advertised for sale in October and November 1851 amounting to over 2,500 acres and premises in Cashel (http://landedestates.nuigalway.ie/LandedEstates/jsp/family-show.jsp?id=2536). In adjacent Site 14, the buildings were still evident at this time but whether they were still habitual was unclear (O'Brien, R. 2013e).

1st Edition OS 25-inch map

By the time the 25-inch map was recorded at the beginning of the 20th century only Ryan's farm remained extant within the townland (Figure vii). The Site 14 buildings no longer survive and this clearly means they were removed between *c.* 1870 and 1901–05, in the last three decades of the 19th century.

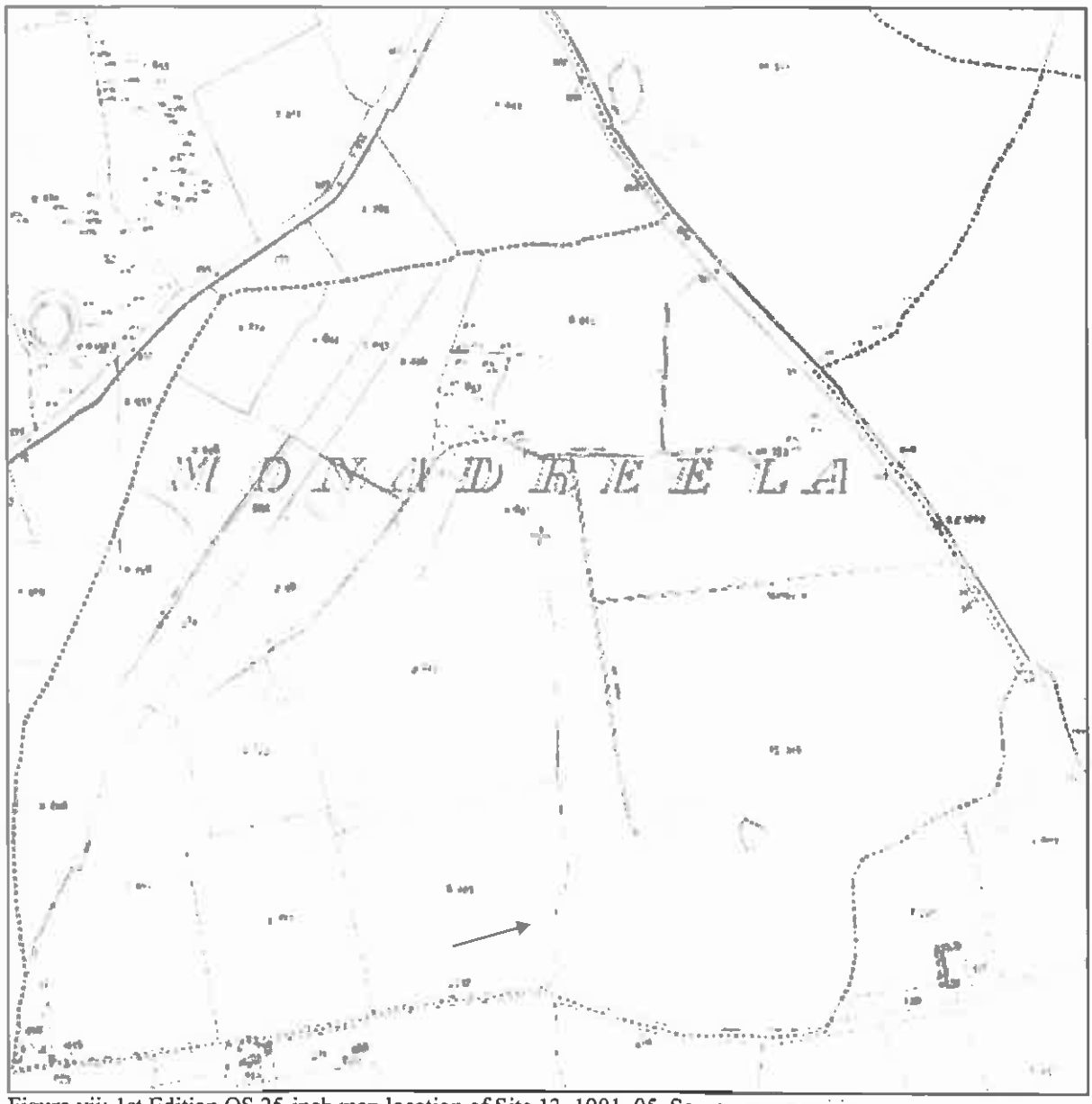

Figure vii: 1st Edition OS 25-inch map location of Site 13, 1901–05. Source: www.osi.ie

There is no change to any of the Monadreela field boundaries on either the 2nd or 3rd edition OS six-inch maps (see Figures ix and x).

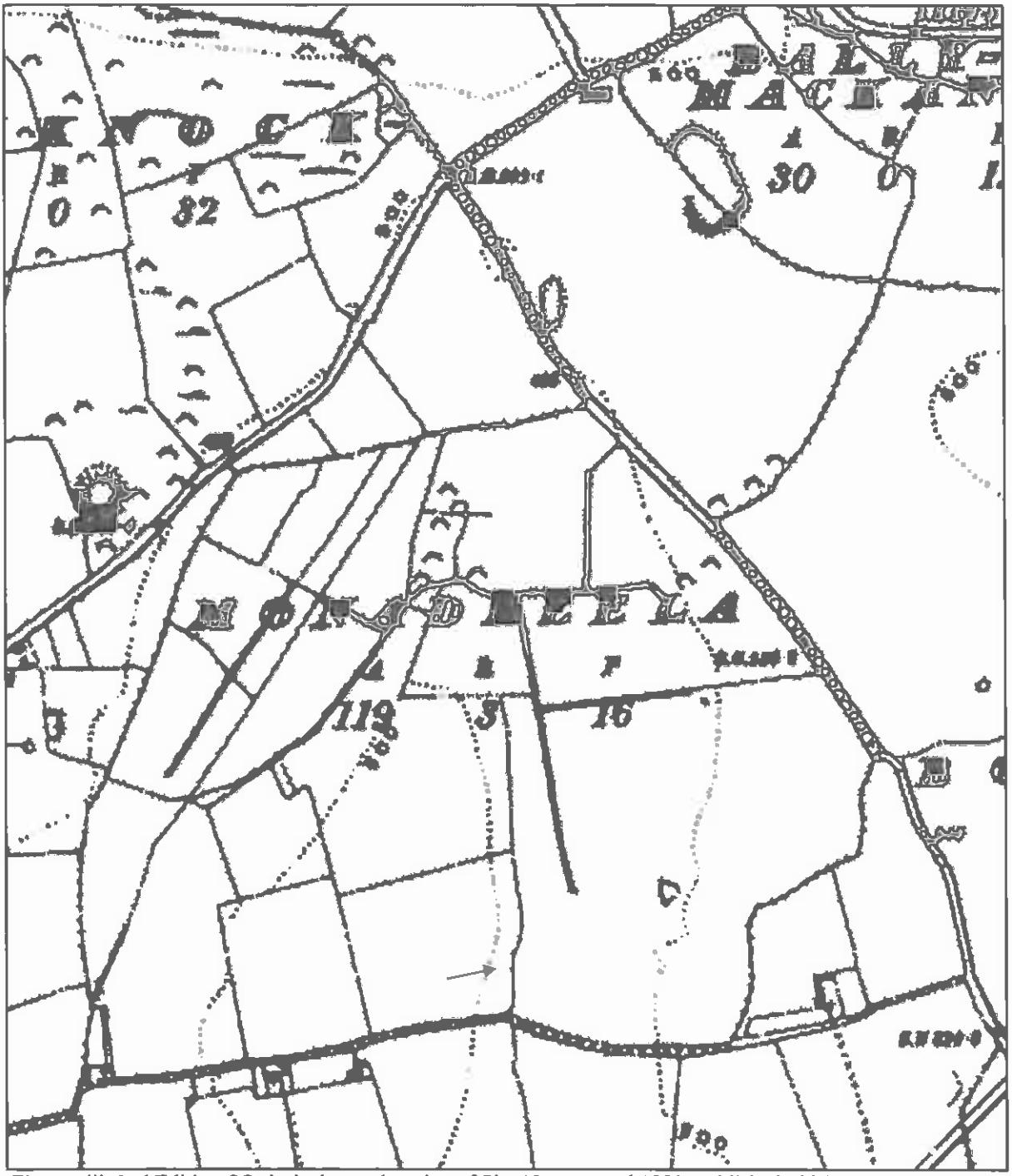

Figure viii: 2nd Edition OS six-inch map location of Site 13, surveyed 1903, published 1906. Source: www.osi.ie

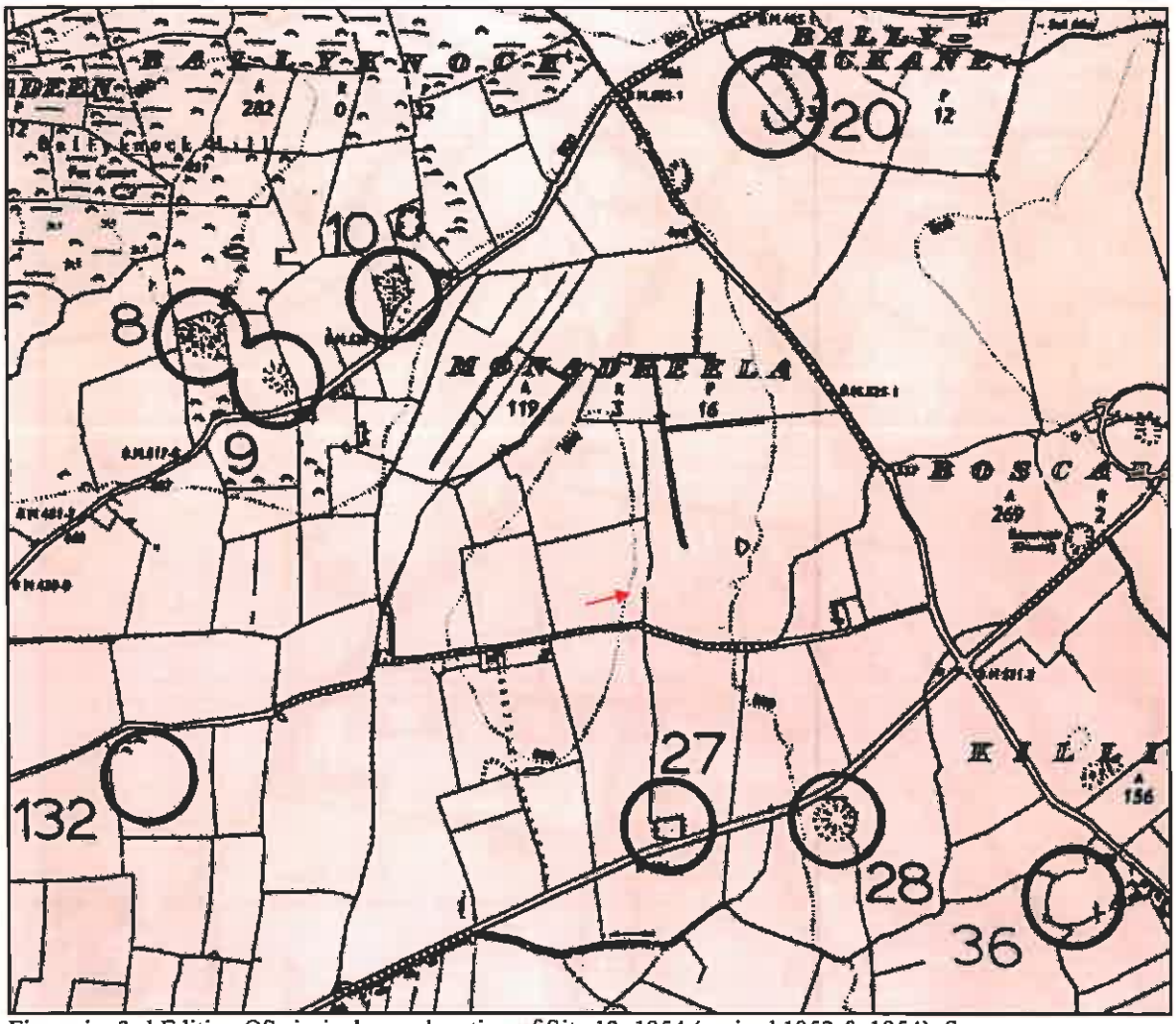

Figure ix: 3rd Edition OS six-inch map location of Site 13, 1954 (revised 1952 & 1954). Source: www.osi.ie

Vertical Aerial Information

As can be seen below significant changes within Monadreela occurred since the 1950s (Plates 1 & 2). The north-south aligned field boundary, common to sites 10–14, was removed prior to 1994. Also, the east-west aligned field boundary between sites 5 and 6 was removed, while to the west of the townland the north-south aligned field boundary running north from Croke's Lane no longer survives. The east-west aligned field boundary was partially investigated during the Site 5 excavation (03E0299). The removal of such boundaries was a common occurrence post the 1950s as a consequence of increased mechanisation of agriculture, favouring larger fields over small units (Feehan 2003, 375–77). Local oral tradition includes a reference to a burial ground in Monadreela location unknown.

Plate 1: Vertical aerial image of Monadreela townland taken in 1994; N to right (source: South Tipperary County Council)

Plate 2: Vertical aerial image of Monadreela townland taken in 2000 with Croke's Lane marked; N to right (source: Kilkenny County Council)

EXCAVATION (Figures x, 3–15 & Plates 3–52)

The sequence of archaeological investigations in Monadreela was informed by the results of the Phase 1 archaeological test excavations (Lennon 2002). It was decided in consultation with South Tipperary County Council that the areas be sub-divided for either further testing or fixed price resolution works. Testing consisted of sites 6, 8, 10, 12 and 14 while resolution, where definite archaeology had been found during Phase 1 works, were sites 5, 7, 9, 11 and 13 (Figure x). On Site 13 the area investigated measured 50 m north-south by 66 m east-west between chainage 6540–6590, *c.* 3,300 m². The ground level sloped from west to east with a more gentle decline from north to south. The field was under pasture prior to excavation and the eastern side was prone to water-logging. The centre of the site measured 149.09 m OD (pre-excavation ground surface), with the base of some archaeological features at 148.43 m OD. Those features revealed during the Phase 1 testing in 2002 were re-located and excavated (see Appendix 1 for details).

Topsoil

The topsoil (47) was friable mid brown sandy clay with frequent fibrous organic (root) inclusions. In composition it was unchanged but east of the former field boundary it was noticeably peaty. The depth ranged from 0.15–0.7 m, following the contour of the Monadreela ridge rising westward from the low-lying waterlogged land at east. A flint blade 03E0378:13 was retrieved from the topsoil.

Subsoil

The natural subsoil (48) was light greyish yellow sandy clay with 10–20 % small gravel and very occasional large stones. This subsoil was present throughout the excavated area with the exception of the low lying waterlogged ground at the east of the site where grey-white marl (96) with occasional macerated limestones was present.

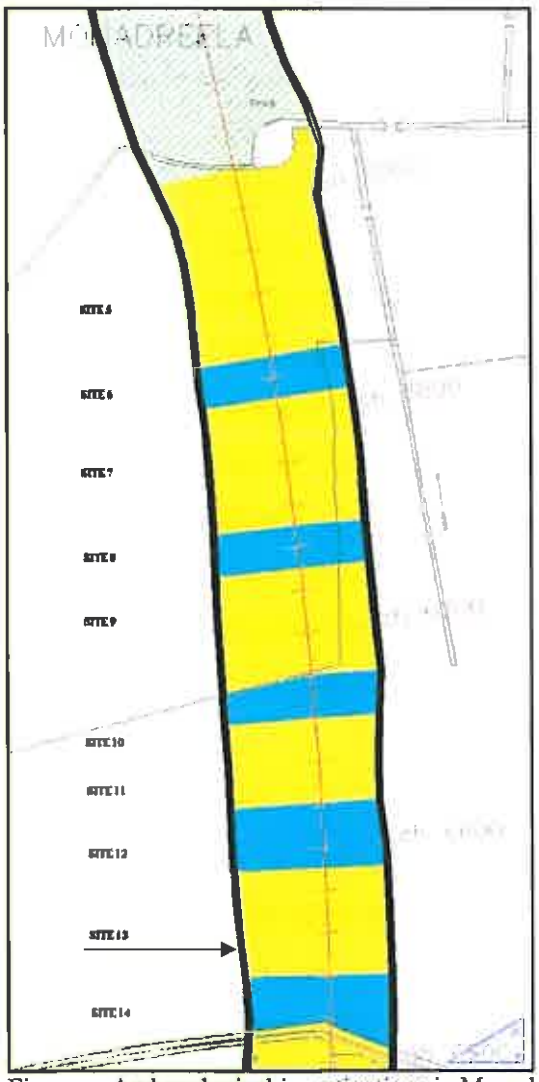

Figure x: Archaeological investigations in Monadreela in 2003, Sites 5–14

Plate 3: Topsoil stripping along the Monadreela hillside Sites 7-13, facing south-west

Plate 4: Site 13 at left with testing of Site 12, facing south-west

Plate 5: Site 13 fully topsoil stripped, facing north-west with Ballyknock hill to rear

Potential Mesolithic or Neolithic Evidence(see Appendix 8)

A heavily burnt mid portion of a flint blade (03E0378:13) was recovered as a surface find (47). Analysis of the object showed it retained some steep retouch on its left lateral edge.

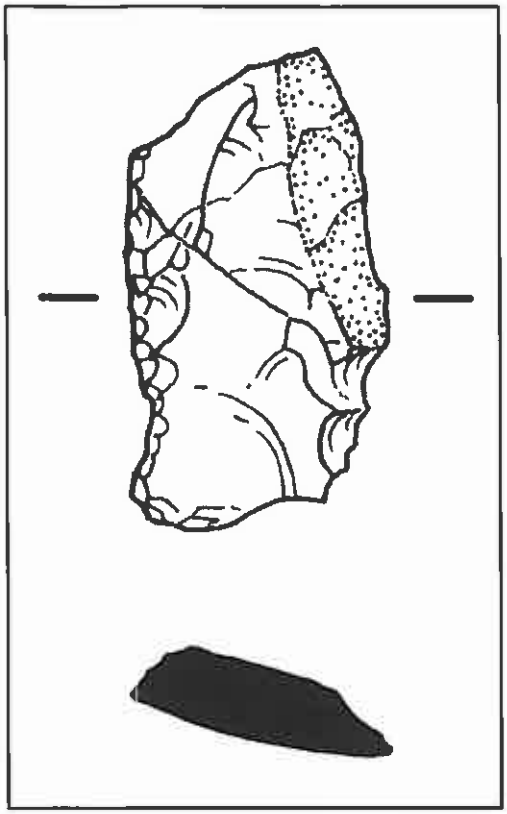

Illustration 1: Portion of flint blade 03E0378:13

Copper Age evidence (Figures 6, 8 & 13)

A pair of Copper Age pits was located at the west edge of the road-take and an alteration of only 2 m within the road design would have not identified these pits. The pits were hugely significant in terms of material culture as they provided some of the best evidence for Copper Age/ Early Bronze Age settlement in the Cashel area, spanning the 23RD to 25TH centuries BCs. It is evident that both pits were directly associated with one another and must relate to some of the other undated features located between 6–10 m to the east, and relate to unidentified archaeology on the remainder of the Monadreela/Boscabell hillside.

Plate 6: Mid-excavation of pits [83] & [86] at west baulk, facing west

Pit [86] was the northern-most of the pair aligned on a north-west/south-east axis. It was sub-circular in plan measuring 0.92 m long, 0.9 m wide and 0.4 m deep. The basal deposit (99) was friable dark brown silt with occasional small pebbles, charcoal and infrequent large stones. Alder (*Alnus glutinous)* charcoal was radiocarbon dated to 2334–2140 cal. BC (UBA-13902). This had been sealed at the corner of the pit by re-deposited natural material (100), compact yellow-brown clay with occasional charcoal flecks and angular pebbles throughout. In turn this localised deposit was sealed by another re-deposited material, (108) - mottled ashy/lime with occasional charcoal flecks. These deposits were simultaneous events as there was no evidence of silting-up between them (Section B2-B3). The entire pit was then filled with a 0.66 m wide and 0.14 m deep friable dark brown silt with frequent charcoal flecks, and occasional small angular pebbles and degraded sandstones (87). Charred wood was noted in a distinctive lens throughout the pit, indicating burnt timbers being dumped too. Ash (*Fraxinus excelsior*) charcoal from (87) was radiocarbon dated to 2467–2236 cal. BC (UBA-13737). As there was a clear overlap between both dated deposits the entire pit had been filled very quickly (Section C2-C3).

Environmental analysis of the pit fills also identified wood species dominated by oak (*Quercus sp.*), hazel (*Corylus avellana*) and ash in that order. From basal fill (99) one carbonised oat chaff (*Avena sp.*) was identified; in addition, carbonised plant remains consisting of five fragments of oat, three fragments of barley (*Hordeum sp.*) and two fragments of emmer wheat (*Triticum dioccocum*) were also found (see Discussion below).

Plate 7: Mid-excavation of pit [86] facing south, scales 0.2 m & 1 m

Plate 8: Mid-excavation of pit [86] with removal of deposit (87) facing south, scale 0.2 m

Plate 9: Full extent of deposit (99) facing south, scale 0.2 m

Plate 10: Partial excavation of deposit (99) facing east, scales 0.2 m & 1 m

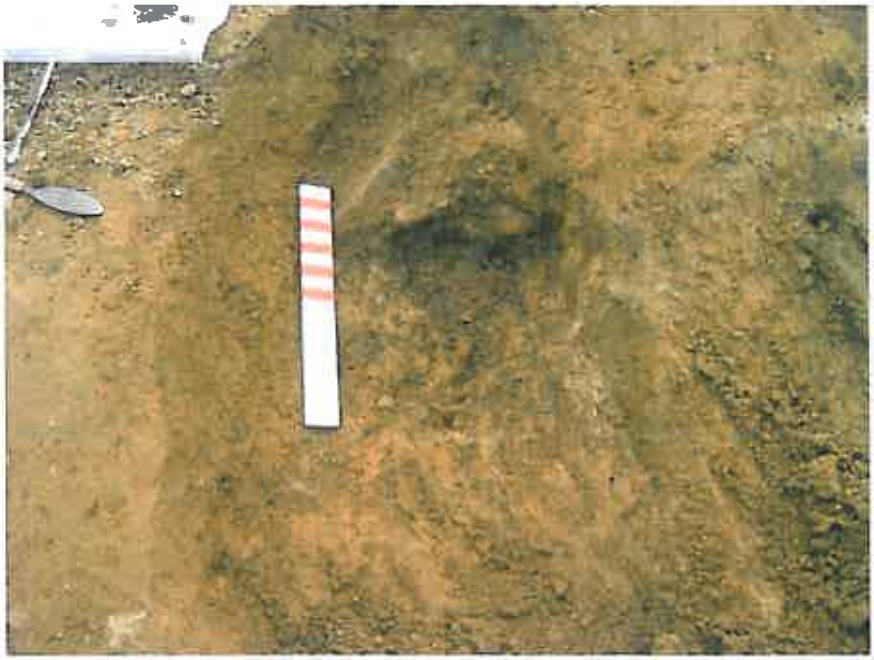

Plate 11: *In situ* pottery in fill (99), scale 0.2 m

Contemporary pitting occurred only 2 m to the south when pit [83] was dug, this time on an east/west axis. Pit [83] was sub-oval in plan with steeply cut edges and possible undercut on the southern side. Measuring 1.41 m long, 1.02 m wide and 0.3 m deep it was substantially wider but shallower than nearby pit [86]. The base of the pit consisted of *in situ* burning (85) and at its' south-east corner there was a localised deposit (97)—red ash and burnt clay (Section D2-D3). Also within deposit (85) multiple sherds of Early Bronze Age pottery (representing 10 vessels), a polished stone axe (03E0378:20), worked flint (including debitage), quartz (03E0378:15), a possible hammerstone (03E0378:16), 15.3g of cremated animal bones and significant quantities of charred hazelnut shells were recovered. Hazel charcoal from (85) was radiocarbon dated to 2457–2204 cal. BC (UBA-13903). Environmental analysis of the pit fills identified carbonised plant remains only from basal fill (85); here, four fragments of barley and 33 fragments of crab-apple (*Malus cf slyvestris*) were revealed—this is the earliest evidence for the use of this wild apple in the Cashel area. The same deposit contained wood species dominated by hazel, with lesser quantities of alder, oak and ash in that order. An identical assemblage of wood species was found from the sealing deposit (84)—dominated by hazel—except for the addition of four fragments of cherry-type (*Prunus sp.*).

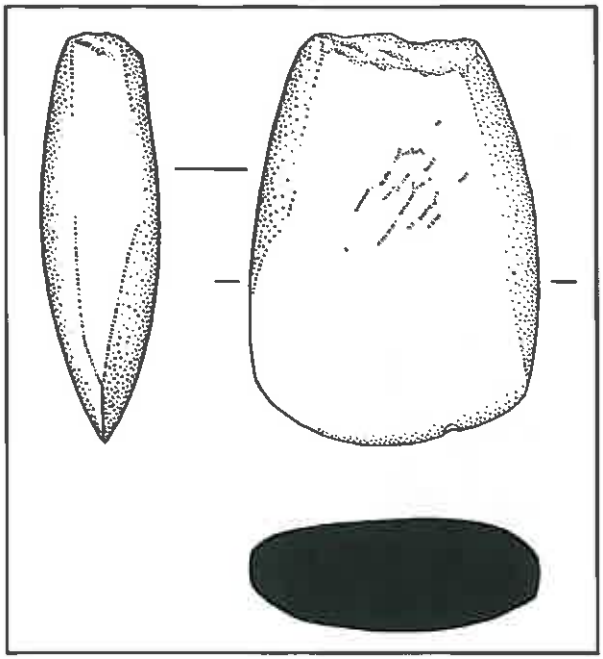

Illustration 2: Stone axe 03E0378:20

Plate 12: Mid-excavation of pit [83] facing south-east, scales 0.2 m & 2 m

Plate 13: Mid-excavation of fill (85) showing pottery & stone axe

Plate 14: *In-situ* pottery & charred hazelnuts in fill (85), scale 0.2 m

The remainder of the pit was then sealed by a 1.23 m wide and 0.22 m depth of friable brown silt (84), with mottled grey-orange patches and frequent charcoal flecking and organic material. This sealing deposit was very similar to the upper deposit in pit [86] too. Upon excavation the north-east corner of the pit slightly splayed out, making the overall shape more irregular.

Plate 15: Mid-excavation of pit [83], facing south-east

Plate 16: Polished stone axe 03E0378:20 from pit [83]

Plate 17: The cultural assemblage from pit [83]

Plate 18: Post-excavation of pit [83] facing west, scale 2 m

Pit [95] was located 14 m east from the pits already described and although it too produced evidence of Copper Age activity, in the form of a radiocarbon date, the pit is more likely to be associated with the nearby Late Bronze Age activity, represented by pit/hearth [71]. Pit [95] was a very irregular feature when excavated and may even have been a tree-bole, perhaps associated with the vernacular settlement *c.* 20 m to the south (excavated as Site 14). The pit was filled with a mixture of deposits – (94) friable orange-brown clayey silt with frequent charcoal flecking and patches of oxidised clay towards the base of the feature,

(101) a lens of white mottled silt contained within deposit (94), and sealed by friable orange-brown sandy silt with moderate charcoal flecking and occasional small stones (93), which undulated throughout the pit, as can be seen in Section K-K1 and Plate 19. One small fresh laminar flint blade (03E0378:12) was recovered from this fill. Alder charcoal found within basal deposit (94) was radiocarbon dated to 2484–2236 cal. BC (UBA-13736). In addition to the alder identified from environmental analysis the wood species was dominated by oak charcoal.

Plate 19: Mid-excavation of pit/tree-bole [95]

Late Bronze Age evidence (Figures 7 & 12)

At the north side of the site, close to the junction with Site 12, two intercutting features were revealed (Section Z-Z1). Pit [09] was sub-oval in plan with slightly undercut edges and a concave, irregular base. It measured 0.94 m long, 0.62 m wide and 0.44 m deep and was filled with two deposits. A basal deposit (10), loose dark greyish-brown sandy silt with occasional charcoal flecking (only of oak) and small gravel pieces was sealed by a 0.26 m depth of loose orange-brown sandy silt with occasional angular sandstones and charcoal flecking (11). Hazel charcoal found within this deposit was radiocarbon dated to 1299–1059 cal. BC (UBA-13734). Significantly, both deposits contained carbonised barley and from (11) also, indeterminate cereals in low quantities.

Once the pit had filled up its' west side was cut by a much shallower pit, [13], measuring 1m long, 1.34 m wide & 0.04–0.06 m deep. This later pit was filled with a

deposit of friable brown-orange sandy silt with occasional charcoal flecks and small rounded pebbles. The eastern edge of the deposit consisted of firm greyish-brown sandy silt with frequent charcoal flecking & occasional pieces of burnt/decayed sandstone. It may have been coincidental that this charcoal-rich deposit was directly over the centre of the earlier pit, [09]. There was no evidence of these later deposits subsiding into the earlier pit, suggesting they were either sporadic depositions and/or pit [09] had been well sealed by this time.

Plate 20: Mid-excavation of pit [09] facing north, scales 0.5 and 2 m

Plate 21: Post-excavation of pit [09] facing south, scales 0.5 and 2 m

Early Iron Age evidence (Figure 6)

One feature on the site provided evidence from the Early Iron Age period, the earliest such dating from the Cashel area. A pit located beside the larger pit/tree-bole feature [95] was found amongst a number of other, undated features - stakehole [75], and pits [89] and [92]. Further pits were located to north and south within a 5 m radius – pits [43], [50], [110], [120] and [122] (see below). Pit [71] was sub-circular in shape with gently sloping sides down to a regular, concave base. It measured 0.4 m long, 0.36 m wide and 0.12 m deep and was filled with three deposits. The basal fill was very shallow (0.02 m deep) friable brown sandy silt with occasional charcoal flecking (72). Cherry-type charcoal found within this deposit was radiocarbon dated to 806–598 cal. BC (UBA-13735). The deposit was sealed by a 0.1 m depth of firm dark brown-black mottled sandy silt with frequent chunks of charcoal and gravel (73). Fire-baked pink-red sandy silt with occasional charcoal flecking (74) had sealed this deposit but only at the east side of the pit. As this localised *in situ* burning was only 0.05 m deep not much can be deduced from it, as it was likely the upper portion of it had been ploughed away. Environmental analysis identified hazel, oak and cherry-type charcoal from basal deposit (72); oak and very little hazelnut shell from primary deposit (73) and ash charcoal exclusively from upper deposit (74). This analysis confirmed the same wood species were being utilised on site since the Early Bronze Age period.

Plate 22: Mid-excavation of pit [71] & stakehole [75] facing south, scales as shown

Plate 23: Post-excavation of pit [71] & stakehole [75] facing west, scale 0.2 m

Undated features

The remaining features excavated on the site consisted of undated pits, postholes and a stakehole. These features could be associated with any of the dated periods of site activity.

Features beside the Iron Age pit (Figures 6–15)

As mentioned above stakehole [75] and pits [92] and [89] were located close to the Iron Age pit [71], and pit/tree-bole [95]. Stakehole [75] was found immediately north of pit [71] and comprised the only definitive structural feature in this area (see above Plate 23). It was circular in plan with steeply sloping northern edge with the remaining being a more gradual cut, down to concave base. It measured 0.15 m diameter and 0.15 m deep, filled with friable greyish-brown sandy silt with occasional charcoal flecks and small pebbles (76).

Approximately 1 m south of pit [71] pits [92] and [89] were located (Figure 10 Section K-K1). Pit [92] was sub-oval in plan with generally steep edges although the south-eastern side which was cut more gradually down to a concave base. It measured 0.57 m long, 0.38 m wide and 0.38 m deep and was filled with three different deposits. Two basal deposits of sandy silts of varying colours (90) and (91) were sealed by friable orange-grey silty clay with occasional charcoal flecking and stones (98). Almost adjoining this pit was another, much shallower pit [89], sub-oval in plan and measuring 0.26 m long, 0.16 m wide and 0.1 m deep. It was filled with orange-brown sandy silt with occasional charcoal flecking and small stones, almost identical to the upper fill noted in the nearby pit.

Plate 24: Mid-excavation of pit [92] facing south-west, scale 0.2 m

Plate 25: Post-excavation of pits [89] & [92] facing south-west, scale 0.2 m

Pits north-east of Iron Age pit (Figures 6, 10 & 11)

Three closely-spaced pits [110], [120] and [122] were located *c.* 4 m north-east of Iron Age pit [71]. Pit [110] was sub-oval in plan, measuring 0.71 m long and 0.62 m wide, broadly similar to the adjacent pits, but at 0.34 m deep, was substantially deeper. It was filled with compacted grey-brown sandy silt with occasional charcoal flecking (both of hazel and hazelnut shell) and angular sandstones (121). Upon excavation a possible post-pipe was revealed, inserted into its' northern side, closest to the adjacent pits. The section drawing had not recorded the post-pipe but the following photograph does.

Plate 26: Post-excavation of pit [110] facing north, scales 2 m & 0.2 m

To the immediate north pit [122] was the larger of the pits at 0.88 m long, 0.48 m wide and 0.12 m deep, with shallow cut edges to an uneven base. It was filled with two deposits of brown silty clay with frequent charcoal flecks and rounded gravels (121), sealed by friable brown silty clay with occasional charcoal flecking and some smaller sandstones and limestones (109). Once the pit had been infilled its' western side had been cut into by another pit, [120] (Section T-T1). Pit [120] had shallow cut edges and an irregular, concave base. It measured 0.81 m long, 0.68 m wide and 0.1 m deep, filled by (119), firm light greyish-brown sandy silt with occasional charcoal flecking, gravel and larger angular sandstone pebbles.

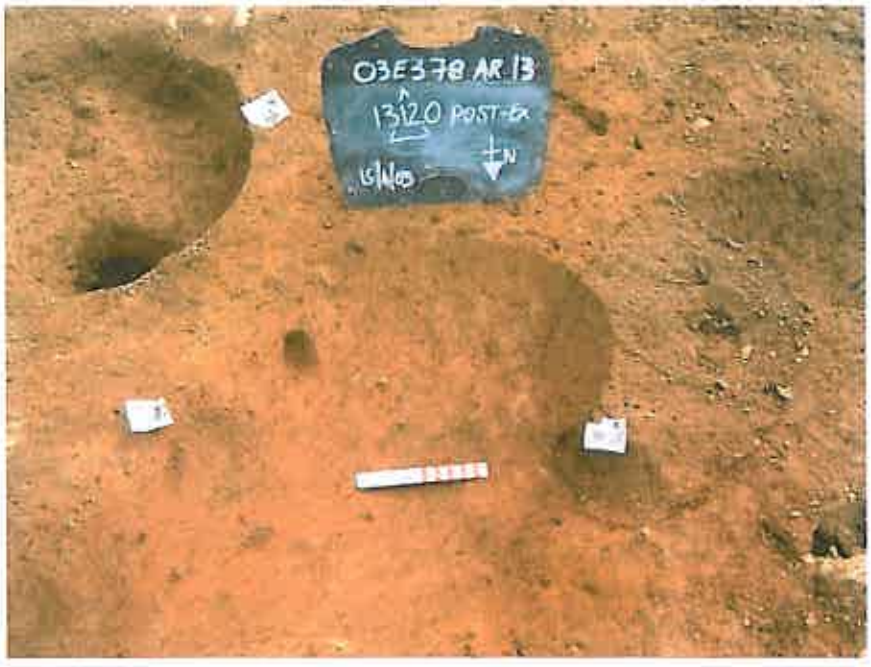

Plate 27: Pit [120] cutting filled-in pit [122] with pit [110] at left, facing south, scale 0.2 m

Pit north of the Iron Age pit (Figures 6 & 11)

Pit [43] was located directly north of Iron Age pit [71] and *c.* 4 m west of the intercutting pit cluster already described. Pit [43] was sub-circular with steep sides leading to a flattish base (Figure 11 Section S-S1). It measured 0.58 m long, 0.52 m wide and was filled with a 0.22 m deep deposit of friable orange-brown silty sand with occasional fragments of small rounded and angular limestones (42). Upon excavation the size and shape of this pit was not too dissimilar to the nearby pit cluster.

Plate 28: Mid-excavation of pit [43] facing east, scale 0.2 m

Pits south of the Iron Age pit (Figures 6 & 10)

Pit [50] was located south-east of Iron Age pit [71] and *c.* 4 m south of the intercutting pit cluster already described (Figures 6 & 11). Pit [79] was semi-circular in shape with steeply cut edges down to an irregular base (Section H-H1). Measuring 0.56 m long, 0.55 m wide and 0.15 m deep it was filled with two deposits: a shallow deposit of friable orange-brown clayey silt with occasional charcoal flecking and small pebbles, (78) which had been sealed by a deeper deposit (77) of friable orange-brown sandy silt with a moderate amount of charcoal flecking and the occasional pebble.

Pit [50] was a sub-oval pit measuring 0.48 m long, 0.5 m wide filled with 0.1 m depth of friable orange-brown clayey silt with occasional charcoal flecking and small pebbles (49) (Section I-I1). The final pit in this southern part of the site was another isolated feature [81], which abutted the western side of the relict field boundary [02]. Consequently it is likely additional pits in this area were destroyed when the field boundary

was erected. Pit [81] was sub-oval in shape with gently sloping north and west sides, with the remainder being more steeply cut down to flattish base. Measuring 0.86 m long and 0.51 m wide it was filled with deposits (80) and (82), 0.17 m deep (Section J-J1). Deposit (80) firm/yellow silty sand with occasional charcoal flecking, sealed by a shallower deposit of malleable yellow-grey clayey sand with frequent charcoal flecking and occasional small pebbles and stones (82).

Plate 29: Post-excavation of pit [81] facing south, scale 0.2 m

Postholes east of the Iron Age pit (Figures 6, 11 & 15)

Three postholes forming in a Y-shaped arrangement were found together *c.* 13 m east from Iron Age pit [71]. Posthole [68] forming the base of the 'Y' was sub-circular in shape with sloping sides down to a roughly V-shaped base (Section U-U1). Measuring 0.56 m long, 0.48 m wide and 0.29 m deep, it was filled with friable grey-brown clay with occasional charcoal flecking (67), sealed by friable orange-brown clayey sand with occasional charcoal flecks and small stones (66). Posthole [65] was circular with a gently sloping west side and steeply cut east side, sloping down to an irregular base. It measured 0.35 m in diameter and 0.15 m deep (Section R-R1). Upon excavation two deposits were identified - (64), very thin friable dark orange-brown clayey sand with occasional charcoal flecking; sealed by orange-brown silty sand with occasional charcoal flecking, ash patches and small stones (63). The last posthole [62] was sub-rectangular in plan, which had steeply sloping sides and a flat base. Measuring 0.41 m long, 0.39 m wide and 0.17 m deep it contained three deposits (61), (60) and (55). The basal fill (61) was friable brown-orange clayey sand with occasional charcoal flecks and stones, sealed by friable orange-brown silty sand with occasional charcoal flecking, (60). A distinct deposit of friable grey-brown silty sand with

frequent charcoal flecking and ash, (55) had been inserted into the southern side of the cut; it is likely this burnt material was the remnants of the post itself, perhaps burnt *in situ* (Section V-V1). As is evident in the accompanying photographs postholes [62] and [65] closely resembled one another and an association is obvious. This may support the notion that a Y-shaped structure – drying rack/utilitarian frame? – was erected here.

Plate 30: Mid-excavation of posthole [65] facing north, scale 0.2 m

Plate 31: Mid-excavation of posthole [62] facing north, scale 0.2 m

Posthole [06] was discovered isolated and *c.* 6 m north of these posts. It was sub-circular in plan with sharp break of slope at the top, straight steeply sloping sides with a sharp break of slope down to a flattish base (Section F2-F3). Measuring 0.28 m long, 0.26 m wide it was

filled with a 0.1 m depth of loosely compacted greyish black clayey silt with occasional charcoal flecking and decayed sandstone fragments throughout, (05).

Plate 32: Mid-excavation of posthole [06] facing south-west, scale 0.2 m

Plate 33: Post-excavation of posthole [06] facing south-west, scale 0.2 m

Features north of the Iron Age pit (Figures 6 & 11)

A number of pits and postholes were identified north and north-east from the Iron Age pit. Three pits [102], [125] and [118] arced from south to north-east while postholes [115] and [145] were single features and postholes [19], [39], [53] and [54] were located in a tight cluster, *c.* 5 m east of the aforementioned pits. It was clear this was an area of intense activity but no recognisable structural layout could be determined on the ground. There was

phased activity as posthole [53] had clearly cut through the side of an earlier posthole, [54]. The pits will first be discussed and then the posthole evidence.

Pit [118] was an irregularly-shaped pit with gradually sloping sides apart from the east side which was cut more acutely down to an undulating base. The wider, northern side undulated along the pit edge but there was no indication that posts had been erected here. The pit measured 1.6 m long, 1.54 m wide and 0.32 m deep, being pointed toward the southern end (Section E-E1). It was filled with friable yellow-brown sandy clay with frequent small to medium decayed stones (117), sealed by compact brown-orange sandy clay with frequent small to medium stones and pebbles, (116). Both deposits appeared to represent re-deposited natural so the pit may have been back-filled quickly after it was dug: the sterile nature of the fills was very apparent.

Plate 34: Mid-excavation of pit [118] facing west, scale 1.2 m

Plate 35: Post-excavation of pit [118] facing south-west, scale 1.2 m

The two remaining pits were located 2 m and 5m west of pit [118]. Pit [125] was sub-circular in plan with steep sides down to a concave base (Section M-M1). Measuring 0.9 m long, 0.7 m wide and 0.2 m deep it was filled with firm greyish-brown sandy silt with occasional charcoal flecks, (126).

Plate 36: Post-excavation of pit [125] facing south-east, scale 0.2 m

Further to the south-west pit [102] was another sub-circular pit with edges sloping down to an irregular, concave base (Section D-D1). The pit measured 0.91 m long, 0.89 m wide and 0.23 m deep, and was distinguished by having multiple fills varying from sterile silty sands to silty clays with occasional pebbles/small stones (103)–(107). The remaining features in this area were six postholes which were concentrated within a 9 m area (see Figure 6). Posthole [115] was the most westerly and was less than 2 m from large pit [118]. It was sub-circular in plan with slightly undercut southern side, the remainder being almost vertical down to a concave base (Section L-L1). Measuring 0.57 m long and 0.55 m wide it was filled with a 0.31 m depth of friable grey-brown clayey silt with occasional charcoal flecks, (114). Posthole [45] lay 7 m directly to the east and in the area between postholes [19], [39], [53] and [54] were clustered together. This pattern was not suggestive of any structure.

Posthole [45] was sub-rectangular in plan with slightly concave sides down to a flat base (Section G-G1). Measuring 0.58 m long and 0.46 m wide it was filled with a 0.22 m depth of friable yellow-grey sandy clay with frequent small stones and pebbles (44) many of which were decayed. Posthole [54] was sub-rectangular in plan with steep sides and gently, sloping base. It measured 0.45 m long, 0.39 m wide and 0.1 m, filled with orange-brown sand with occasional flecks of decayed stones, (52). Its southern side was cut by a narrower and deeper posthole [53], semi-circular in plan with steeply sloping edges down to a distinctive, pointed base (Section N-N1). Measuring 0.36 m long, 0.19 m wide and 0.16 m deep it was filled with friable dark grey-brown silty sand with frequent small gravels, larger decayed stones and moderate amounts of charcoal flecking, (51). Environmental analysis identified wood species of dominated by ash, with much less quantities of hazel, oak and very occasional hazelnut.

Beside and to the north was posthole [39], sub-circular in plan with straight sides and an irregular base (Section Q-Q1). It measured 0.41 m long, 0.38 m wide and 0.32 m and contained two deposits, (38) and (37). The basal fill (38) was greyish-orange silty sand with occasional charcoal flecks and a moderate amount of small stones, pebbles and decayed sandstones, sealed by a similar-type deposit (37) except containing more charcoal. This upper deposit probably represented all that remained of the original post, perhaps suggesting it burnt/decayed *in situ*?

The final posthole [19] was circular with straight cut vertical sides down to an uneven base (Section O-O1). Measuring 0.38 m in diameter and 0.36 m deep it was filled with (18), loose light grey-brown silty sand with occasional charcoal flecks and frequent decayed stones around sides, which comprised the bulk of the post. This was sealed by a

thinner deposit of grey-brown silty sand with occasional charcoal flecks and small pebbles (17). In Section O-O1 this upper portion was not recorded. Posthole [19] was another example where a pre-prepared post had been placed upright into the ground.

Plate 37: Mid-excavation of posthole [19] facing south, scale 0.2 m

Plate 38: Post-excavation of posthole [19] facing north

Undated pits at north of site (Figures 7 & 12)

Four pits were found at the northern end of the excavation lying between the Late Bronze Age pit [09] and relict field boundary [02]. Pit [40] was located 9 m south-east from the dated pit. Pit [40] was sub-circular in plan with irregular concave sides down to an uneven base (Section W-W1). Measuring 0.74 m long, 0.64 m wide and 0.3 m deep it was filled

with (41), friable greyish-brown sandy silt with occasional charcoal flecking and angular sandstones.

Plate 39: Post-excavation of pit [40] facing south, scales 0.5 m & 2 m

Two pits, [69] and [124] were located a further 7 m to the south-east. These pits were spaced 1.5 m apart. Pit [124] was sub-circular in plan, steeply cut at its' west and south sides with the remainder being more gradual (Section X-X1). Measuring 0.5 m long and 0.46 m wide it was filled with a 0.25 m depth of friable yellow-brown clayey silt with occasional mottling patches and iron panning (124). Nearby pit [69] was substantially larger, at 1 m long, 0.89 m wide and 0.3 m deep (Section Y-Y1). It was filled with friable brown silt with occasional charcoal flecking with angular and rounded pebbles, degraded sandstone and root fragments (70).

Plate 40: Post-excavation of pit [123] facing south-west, scale 0.2 m

The final pit in this area was the most northerly feature on the site, pit [130] found 9 m west of relict field boundary [02]. This sub-rectangular pit was orientated on a north/south axis with all edges gradually cut apart from the southern edge, which was more steeply dug, down to a concave base (Section A2-A3). It measured 0.81 m long, 0.45 m wide and 0.21 m deep. Unlike the other pits described here pit [130] was found to contain three deposits which appear to have been sporadically dumped from the eastern side into the pit. The basal fill (129) was friable yellow-grey-brown sandy silt with moderate amount of charcoal with small pebbles and stones. This was partially sealed in the centre by the deposition of (128), a similar fill except with occasional charcoal and pebbles. The similarity in both sandy silts suggested they may in fact reflect a single episode of deposition. Both deposits were partially sealed by (127) friable yellow-brown clayey silt, charcoal flecked and with occasional pebbles.

Plate 41: Post-excavation of pit [130] facing south-east, scale 0.2 m

Undated pits east of field boundary (Figures 4, 5 and 9)

Four pits [04], [08], [16] and [21] were located east of relict field boundary [01] / [02], and had been cut into the marl (96). Pits 08] and [16] were located close to one another with pit [08] being the larger feature. It measured 1.3 m long, 0.56 m wide and 0.36 m deep containing firm greyish-brown fine sandy silt with occasional charcoal flecking (07), in this irregular-ovoid pit (Section A-A1). The smaller pit [16] to the immediate east was also ovoid in shape measuring 0.65 m long, 0.38 m wide and 0.12 m deep (Section B-B1). It contained firm dark orange-brown fine sandy silt with occasional flecks of charcoal (15).

Plate 42: Mid-excavation of pit [08] facing west, scale 0.2 m

Plate 43: Post-excavation of pit [08] facing west, scale 1.2 m

Plate 44: Mid-excavation of pit [04] facing east, scale 0.2 m

Plate 45: Post-excavation of pit [04] facing east, scale 0.2 m

Pit [04], *c.* 8m to the south was sub-rectangular in plan with sharp break of slope at the top, V-shaped sides which tapered to an uneven base (Section C-C1). It measured 0.6 m long, 0.37 m wide and 0.2 m deep. It was filled with compact orange-brown fine sandy silt with occasional charcoal flecking and limestone fragments throughout (03).

Plate 46: Mid-excavation of pit [16] facing west, scale 0.2 m

Plate 47: Post-excavation of pit [16] facing west, scale 0.2 m

The final pit, [21] was located a further 24 m to the south and abutted the Site 14 excavation area. It was another irregular shaped pit measuring1.04 m long, 0.6 m wide and 0.15 m deep and filled with firm orange-brown fine sandy silt with occasional charcoal flecks, small angular and rounded limestone fragments.

Plate 48: Mid-excavation of pit [21] facing south, scale 0.2 m

Plate 49: Post-excavation of pit [21] facing south-east, scale 0.2 m

Field boundary (Figures 4–7 & 14)

Prior to the 1950's an upstanding field boundary had been located at the east of the site, forming the boundary between two fields; the low lying ground prone to flooding at east and the higher dryer ground at west (see Figure iv). However between 1954 and 1994 this boundary was removed in order to make the fields here into one larger field (see Figure ix and Plate 1). Upon excavation the relict field boundary was re-identified and termed [01] and [02]. The boundary was partially investigated here by hand-excavating a slot across it

(Section E2-E3). The feature was more comprehensively investigated as part of the Site 9 excavation (see 03E0345 Final Report).

Plate 50: Pre-excavation of field boundary [01]/[02] facing south

Plate 46 clearly shows the later manipulation of ditch [01] by digging the field drain along its base, allowing the water flow from north to south, from Monadreela down to the field boundary junction at George's-Land, a distance of *c.* 1 km (see 03E0480 Final Report). Plate 47 below shows that ditch [02] did not require such drainage and was left untouched.

Plate 51: Mid-excavation of field boundary ditch [01] facing north, scale 2 m

Plate 52: Mid-excavation of field boundary ditch [02] facing north, scale 2 m

DISCUSSION

The excavations at Monadreela Site 13 revealed a variety of subsoil cut features including pits, postholes, stakeholes and the remnants of the former field boundary. Many of these features were undated and little can be deduced about their date, form and function. Some features must undoubtedly be linked with the pre-1840's dwelling on the north side of Croke's Lane, which may have been a school (see below). However, the definitive archaeological features comprised of two pits which represent some of the earliest Copper Age-dated activity in Cashel; one pit dated to the Late Bronze Age period and, another pit/hearth representing the earliest evidence for the Early Iron Age period in Cashel. Cumulatively, the findings are hugely significant particularly in the richness of the material culture represented in the Copper Age pits. There are many parallels for such intense prehistoric activities in Ireland—see examples below—and wider afield: the multi-phase site at Yarnton in the Thames valley near Oxford, England is a pertinent example. Here, a range of Neolithic and Bronze Age sites and features exhibited similar characteristics as Monadreela, such as pits containing the bulk of the material culture (Hey *et al* 2003, 87). On Site 13 a seemingly dearth of evidence stretching from the Early Iron Age to the Post Medieval period may be explained by the field being used for animal grazing during some eras of this long time-span. The creation of the field boundary, possibly in the Late Medieval period, was a clear example of the local farmers separating the low-lying, peat and marl-dominated eastern side of the field from the podzolic-rich soil in the remainder of the field.

COPPER AGE DISCUSSION

A pair of Copper Age pits was located at the west edge of the road-take and an alteration of only 2 m within the road design would have not identified these pits. The pits were hugely significant in terms of material culture as they provided some of the best evidence for Copper Age/ Early Bronze Age settlement in the Cashel area, spanning the 23rd to 25th centuries BCs. It is evident that both pits were directly associated with one another and must relate to some of the other undated features located between 6–10 m to the east, and relate to unidentified archaeology on the remainder of the Monadreela/Boscabell hillside. The Monadreela material, with its classic Bell Beaker profile, and simple horizontally arranged zonal ornament, conforms to Case's Style 2 and is dated to *c.* 2450–2200 BC (see Appendix 10). These ceramic dating matches the radiocarbon dates from each pit (see below).

Pit [83] was substantially wider but shallower than nearby pit [86]. Pit [86] was the northern-most of the pair aligned on a north-west/south-east axis, measuring less than 1 m in size, therefore being smaller in size than pit [83]. Upon excavation the north-east corner of the pit slightly splayed out, making the overall shape more irregular.

The material culture within the pits

Both pits contained a similar depth of material and there was no indication of borrowing and/or deep ploughing into the upper surface. Upon excavation the basal deposit (99) of pit [86] contained a similar assemblage of cultural material as was noted in the base of pit [83], although on a lesser scale. Burnt clay was also noted in the basal fill of each pit. The base of pit [83] consisted of *in situ* burning and at its' south-east corner, there was a localised deposit (97)—red ash and burnt clay—containing 15.3g of cremated bones identified, where was possible, as faunal (see Appendix 12). This analysis then ruled out a cremation function for the pit, as was previously thought (Bruck & Carlin 2012). The rapid in-filling of deposits within both pits was verified there was no evidence of silting-up between deposits. Both pits were sealed/capped by the deepest deposit noted within each pit; respectively deposit (87) and (84), which represents brown silt with frequent charcoal flecks, and occasional small angular pebbles and degraded sandstones. In summary, the basal and primary deposits contained both the cultural material and/or evidence of burning; most of the hazelnut shells derived from the upper deposit of pit [86], (see below). There was no scorching of the pit edges so the pit firing was confined to the initial stages only, whereupon the later deposits were quickly dumped into the pit.

The material culture was confined to the basal deposit(s) within each pit. The stone axe discovery (03E0378:20) was the second such axe from the N8 Cashel Bypass excavations—another polished stone axe (03E0508:16) was found lying on the natural beneath an Early Bronze Age fulacht fia on Site 23 in George's-Land, two fields to the south— the axe from the basal fill of pit [83] was the earlier of the two. Analysis by Professor Peter Woodman suggested that while small square axes can be found in the Mesolithic and the Neolithic period, the resemblance of the shape of the axe to early copper axes may not be coincidental. The broken surface had either been heavily used or suffered from an attempted reworking. The cutting edge, in such good condition may suggest the axe was not, as commonly happened, used as a wedge at a later date (see Appendix 8). Further analysis showed that many pieces of debitage and two flint flakes (03E0378:18 & 03E0378:19) from the same deposit had been burnt. A possible hammerstone (03E0378:16)

and one quartz (03E0378:15) were found between the interface of (85)/ (84); significantly, the hammerstone also showed signs of being burnt (see Appendix 9).

The ceramic evidence was highly significant as evidence for 12 Beakers was found confined to the basal deposits only; 10 Beakers (Vessels 1–10) from pit [83] and two Beakers (Vessels 11 and 12) from pit [86]. Fine and Domestic Beakers, both plain and decorated, were found in each pit and some pots had been burned during cooking.

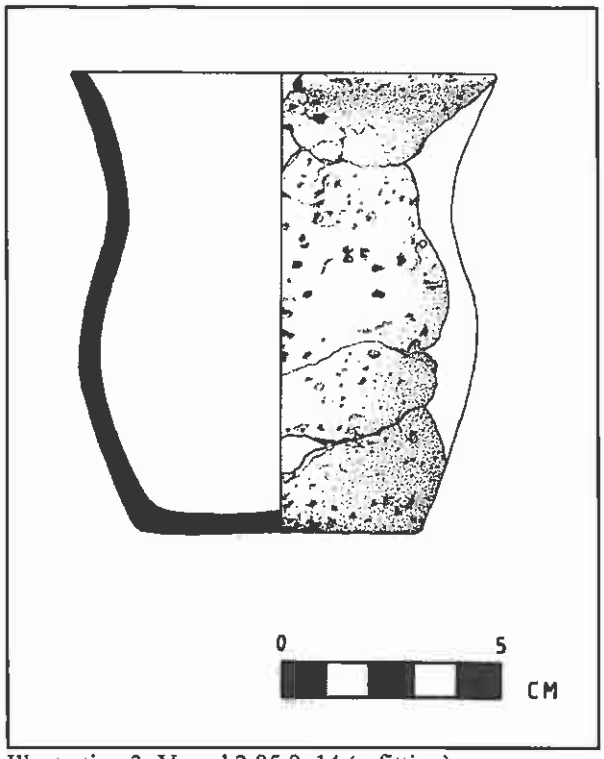

Illustration 3: Vessel 2 85.8–14 (refitting)

Post-breakage patterns on Fine vessel No. 8 from (85) showed it had been used in a domestic context and after breakage part of it, represented by a few burnt sherds, had been in contact with intense heat, probably in a domestic fireplace. Some of the burnt sherds re-fit with unburnt examples. Post-breakage burning was also identified on Vessel 10 from (85), see illustration next.

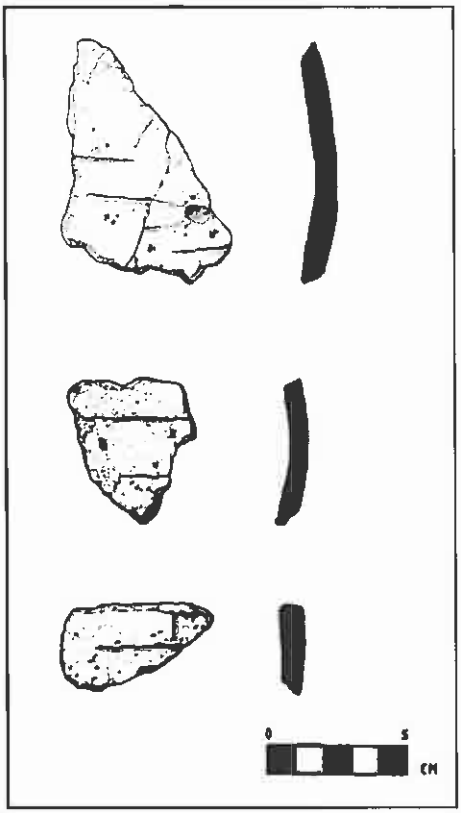

Illustration 4: Vessel 10 85.76a & 85.76b (refit); 85.76 & 85.77

Variable treatment of broken vessels was also demonstrated by material from Vessel 5 from (85) with some heavily abraded examples joining with unworn sherds. Vessel 4 also from (85) was an exceptionally finely made pot that may have been burnished; the external surface was plain but there are evenly horizontal spaced ridges or low cordons on the upper inner surface (Illustrations 5 & 6). Wear, to both surfaces and edge breaks, was common throughout the assemblage and a large number of vessels were represented by only a few sherds: this is a feature of pottery from, and deposited in, domestic contexts (see Appendix 10).

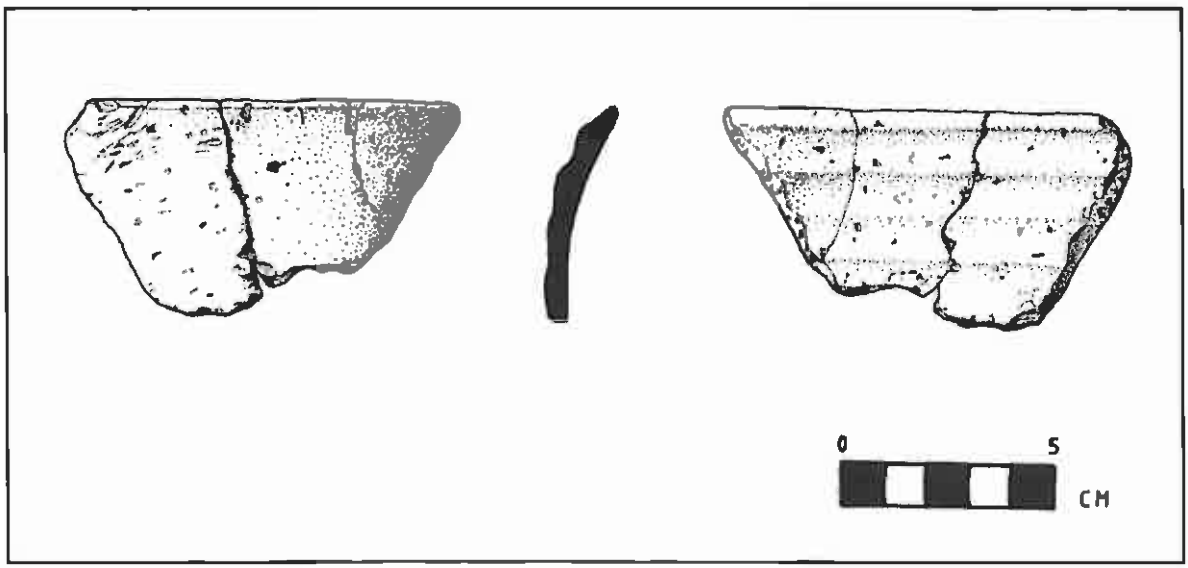

Illustration 5: Vessel 4 85.15–17 (refitting sherds)

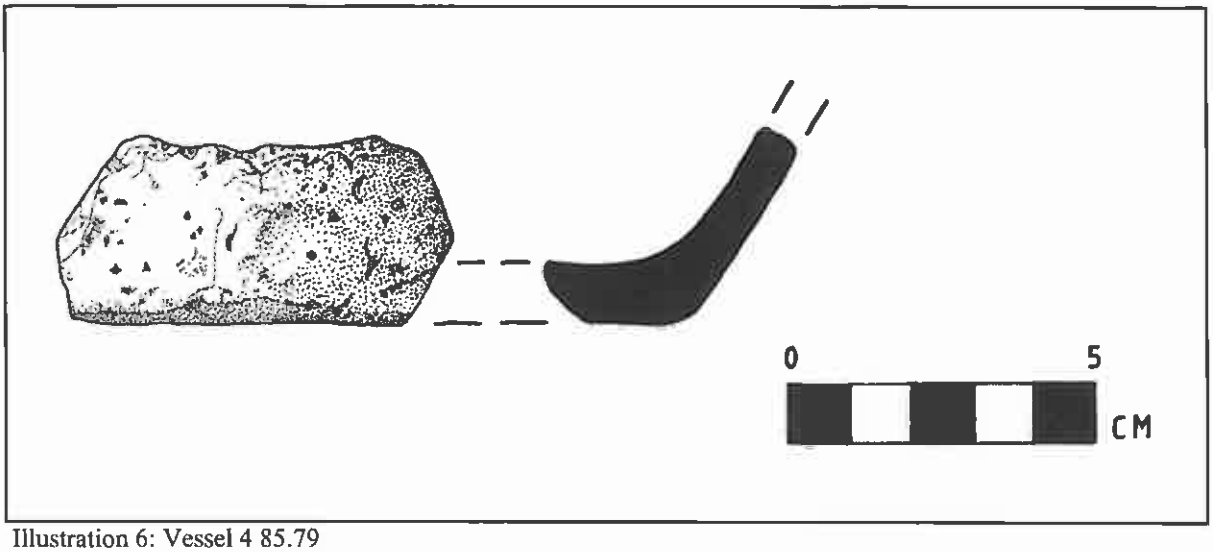

Illustration 6: Vessel 4 85.79

Significantly, traces of grog—crushed pottery—was found in at least six of the vessels with examples found from each pit. In Appendix 10 contemporary Irish sites with evidence of grog are outlined. Gibson (2003, vi)

The environmental evidence from the pits

Environmental analysis of the pit fills identified wood species common to the area at this time. The species were generally the same in each pit and within the deposits where charcoal survived. For instance oak, hazel, alder and ash were represented in basal fill (85) of pit [83] and in the upper, sealing deposit (87) within pit [86]. An identical assemblage of wood species was found from the sealing deposit (84)—dominated by hazel—except for the addition of four fragments of cherry-type. Unsurprisingly, the radiocarbon dates retrieved from each depositional episode were contemporary (see below). Since no pomaceous woods were recorded from pit [86] this material may have represented the remains of gathered food rather than being attached to branches used as fuel.

The evidence from carbonised plant remains was similar and confined to basal fills of each pit: four fragments of barley from (85), with five fragments of oat—including one oat chaff—plus three fragments of barley and two fragments of emmer wheat from (99). Analysis suggested the oat chaff was likely to have been attached to oat grains during the drying process. In Appendix 6 these cereals were discussed and it was concluded they must represent wild oats, a common field weed, which may have grown among other crops at the time (see below). There was no evidence for intrusive material within the pits, plus the cereals were confined to the sealed, basal deposits only. Also from the basal fill of pit [83] 33 crab-apple pips were revealed, the earliest evidence for the use of this wild apple in the

Cashel area. In Appendix 6 other prehistoric sites where charred apple seeds and endocarps have been identified are listed. Further evidence of gathering wild seeds and nuts from the nearby forests came from the large quantities of hazelnut shells from the deposits; in particular, there were abundant hazelnut shells from the sealing deposit of pit [83]. Parker Pearson (2003, 13) discusses the significance of such finds as an indicator to resourcing seasonal foodstuffs in prehistoric Britain, and the conclusions are valid for the Cashel evidence too.

Radiocarbon dates from the pits

Three radiocarbon dates were retrieved from the pit fills: one date from basal fill (85) in pit [83]; two dates from fills within pit [86]—basal fill (99) and upper fill (87). These dates are detailed below in Appendix 14. In summary, hazel charcoal from (85) dated to 2457–2204 cal. BC (UBA-13903); alder charcoal from (99) dated to 2334–2140 cal. BC (UBA-13902); ash charcoal from (87) dated to 2467–2236 cal. BC (UBA-13737). The closeness of the date spans, plus the almost exact replication between the upper fill in pit [86] and the basal fill in pit [83] reflected the contemporaneous nature of these pits. They were clearly dug at the same time, infilled with predominantly the same materials and, back-filled at the same time.

What were the pits used for?[1]

The pits must be considered evidence of a much wider Copper Age-period settlement on the slopes of the Monadreela/Boscabell hillside. Contemporary evidence comes from pits have been also dated to this period on Sites 5–19, approximately 1 km in extent. Throughout this area the evidence was dispersed but the Site 13 pits represented the most concentrated Copper Age activity, and produced the most material culture. It is most likely that the nucleus of the settlement was closest to Site 13, with contemporaneous pits in nearby sites 15 and 16 possibly marking the core extent of the settlement. On Site 16 (03E0427) ash charcoal from fill (164) of pit [163] was dated to 2464–2210 cal. BC (UBA-13738). A second, nearby pit [121] produced a tertiary fill (151) of charcoal-rich soil and heat-shattered stones from which birch charcoal dated to 2457–2202 cal. BC (UBA-13905). In the same field on Site 15 (03E0394) ash charcoal from the fill of pit [411] dated to 2341–2142 cal. BC (UBA-13904), slightly later in date than the activity here (see O'Brien 2013f; O'Brien 2013g & O'Brien 2013h).

[1] Thanks to Dr. Kerri Cleary for the information on the Cloghers, Doonmoon and Ross Island sites.

On Site 19, also in Boscabell excavation of pit [119] revealed three small circular stakeholes cut into the base of the pit and sealed by the basal pit deposit. A deposit sealing this contained frequent heat-shattered stones and alder / hazel charcoal was dated to 2465–2210 cal. BC (UBA-14362). In turn, this was sealed by a similar deposit with fewer heat-shattered stones and birch charcoal was dated to 2458–2155 cal. BC (UBA-14361). Also found from this upper fill was a small fragment of chert debitage 03E0426:22 and a possible chert core 03E0426:23, from which flakes may have been struck. Both artefacts are evidence of Copper Age tool production on site (see 03E0426 Final Report).

Other excavations on the bypass have provided evidence of continuous Copper Age settlement activity, for instance on Windmill Hill to the south-west. Features excavated on Site 35 (03E0424) were clearly contemporary: a posthole located beside two undated charcoal spreads was radiocarbon dated to 2469–2299 BC (UBA-13797). Two nearby pits were contemporary dating to 2204–2037 BC (UBA-13800) and 2134–1910 BC (UBA-13795) respectively (O'Brien 2013r). To the north-east of Cashel a number of Early Bronze Age sites were discovered on the M8 Cullahill to Cashel Road Project, the nearest being two sites in Borris townland (Conboy & Green 2009; Conboy, Hardy, Stevens & Green 2010). This hypothesis would suggest the settlement extended *c.* 100 m in a north-south direction along the hillside.

Upon excavation pit [83] was found to be orientated an east-west axis and in form, the sides and depth of the cut were uniform. However, at the north-eastern corner there was a variation where the cut edge extended slightly outward, measuring 0.2 m in diameter. During excavation the director believed that this was evidence for an upright post, marking the location of the pit (see Plates 12 & 18 above). Such evidence is often found with burials and has a long tradition in Ireland, with an Early Mesolithic example from Hermitage, Co. Limerick (Collins 2009, 876). At Doonmoon, Co. Limerick, a pit contained 200 sherds representing up to 23 mainly incomplete Beaker pots, three heat-shattered pieces of flint; a greenstone axe was found among the sherds near the base of the pit (Gowen 1988, 53–4). This evidence compares favourably with Site 13 in that the pottery and stone axe were also confined to the base of the pit.

In Ross Island Co. Kerry surface deposits in the Western Shelf contained similar occupation material as on Site 13; ore-processing sediments, hammerstones and anvil blocks, bone fragments, a quernstone, polished stone axehead and Beaker pottery (O'Brien 2004, 303). At Cloghers, also in Co. Kerry, a pit contained two beaker sherds, 11 flint flakes, barley grains, a complete polished stone axe, one hammerstone and a grinding stone and this was thought to represent a stone axe production kit (Kiely and Dunne 2005). The

potential for one or both pits, or some of the contemporary pits in nearby sites, to have been pottery firing pits should not be ruled out either. It has been suggested by Gibson (2002, 45) that such pits can leave little archaeological traces to definitively point to a pottery firing function.

Pit/Tree-bole

Pit [95] was located 14 m east from the pits already described and although it too produced evidence of Copper Age activity, in the form of a C14 date, the pit is more likely to be associated with the nearby Late Bronze Age activity, represented by pit [71]. Pit [95] was a very irregular feature and may even have been a tree-bole, perhaps associated with the vernacular settlement *c.* 20 m to the south (excavated as Site 14). It was filled with a mixture of deposits with patches of oxidised clay towards the base, a lens of white mottled silt and sealed by orange-brown sandy silt which undulated throughout the pit. One small fresh laminar flint blade 03E0378:12 was recovered from the upper fill. Alder charcoal in basal deposit (94) dated to 2484–2236 cal. BC (UBA-13736). In addition; to the alder identified from environmental analysis the wood species was dominated by oak. It is considered the alder and indeed the flint blade may have been disturbed from an earlier deposit when the pit/tree-bole was dug.

LATE BRONZE AGE DISCUSSION

At the north side of the site two intercutting pits [09] and [13] were revealed. The earlier pit [09] contained a basal deposit (10), greyish-brown sandy silt with occasional charcoal flecking (of oak); in turn sealed by a 0.26 m depth of orange-brown sandy silt with occasional angular sandstones and charcoal flecking (11). Hazel charcoal from (11) dated to 1299–1059 cal. BC (UBA-13734). Significantly, both deposits also contained carbonised barley and from (11), indeterminate cereals in low quantities. Once the pit had filled up a much shallower pit, [13] was cut into its' west side. This later pit was filled with a deposit of friable brown-orange sandy silt with occasional charcoal flecks and small rounded pebbles. The eastern edge of the deposit consisted of firm greyish-brown sandy silt with frequent charcoal flecking & occasional pieces of burnt/decayed sandstone. It may have been coincidental that this charcoal-rich deposit was directly over the centre of the earlier pit, [09]. There was no evidence of these later deposits subsiding into the earlier pit, suggesting they were either sporadic depositions and/or pit [09] had been well sealed by this time? As rubbish pits from other settlement sites in Monadreela were contemporary

such evidence showed an intensive use of the hillside in this period. For instance, a number of pits located within a 20 m radius were all undated: these included large pit [300] excavated on adjacent Site 12 (O'Brien 2013d). On Site 5, *c.* 300 m to the north pit [89] contained burnt bones (unidentified to species), a chert blade / flake and cherry-type charcoal dated to 1297–1056 cal. BC (UBA-13699). It was not possible to determine if this was a cremation deposit, a 'blind cremation' or a domestic deposit of wood waste. The fill of a nearby pit [97] contained no artefacts but hazel charcoal was dated to 1011–907 cal. BC (UBA-13701), being broadly contemporary with pit [89].

To the south on Site 19 in Boscabell townland, posthole [80] contained charcoal flecking from which hazel was dated to 1258–1028 cal. BC (UBA-13742), the end of the Middle Bronze Age period. This posthole had been found close to Structure 2, one of a number of possible Bronze Age structures identified here (see 03E0426 Final Report). In the wider hinterland contemporary sites were also found: a sub-circular structure at Killemly near Cahir was radiocarbon dated to 1256–1012 cal. BC, while a larger settlement complex in nearby Ballyegan was radiocarbon dated to 1253–1007 cal. BC (McQuade *et al.* 2009, 29); north-east of Cashel in Ashhill townland a stakehole comprising the trough of a burnt mound was radiocarbon dated to 1052–896 cal. BC (Moore, Green, Hardy & Breen, 2009). Cumulatively, there was abundant evidence for a continuous and vibrant Bronze Age presence around the Cashel/River Suir region, attested to also in the material culture of the time (Grogan 2005, 145–150).

EARLY IRON AGE DISCUSSION

One feature on the site provided evidence from the Early Iron Age period, the earliest dated instance of such evidence from the Cashel area. A pit located beside the pit/tree-bole [95] (see above) was found amongst a number of other, undated features - stakehole [75], and pits [89] and [92]. Further pits were located to north and south within a 5 m radius – pits [43], [50], [110], [120] and [122]. Pit [71] was a smallish pit measuring less than 0.5 m in diameter and only 0.12 m deep. Upon excavation three deposits were noted, a very. The very shallow basal fill (72) contained cherry-type charcoal dated 806–598 cal. BC (UBA-13735). This date is at the threshold of the accepted beginnings of the Early Iron Age (see Becker 2012, 9), although the archaeology of the Monadreela/Boscabell hillside showed largely uninterrupted settlement through-out the Bronze Age. The next deposit (73), dark brown-black mottled sandy silt had frequent chunks of charcoal and gravel. In turn, this was sealed only on its east side by fire-baked pink-red sandy silt (74), also with occasional

charcoal flecking. As this localised *in situ* burning was only 0.05 m deep not much can be deduced from it, as it was likely the upper portion of it had been ploughed away. Environmental analysis identified hazel, oak and cherry-type charcoal from basal deposit (72); oak and very little hazelnut shell from primary deposit (73) and ash charcoal exclusively from upper deposit (74). This analysis confirmed the same wood species were being utilised on site since the Early Bronze Age period.

In the same field to the south two pits were dated 752–409 cal. BC (UBA-13740) and 537–400 cal. BC (UBA-13741), clearly indicating intensive settlement activity in these fields (see Site 18, 03E0425 Final Report). South of Cashel a potential ritual site at Knockgraffon also post-dated the activity on Site 13. The Knockgraffon site consisted of an arc of eight postholes dated to 380–50 cal BC (SUERC–25889) while an internal posthole to the arc was contemporary, dated to 380–90 cal BC (SUERC–25890). Artefacts recovered included unidentified prehistoric pottery, a polished stone axe, three highly polished stones, two copper-alloy fragments and cremated bone (MacLeod 2012, 200–1).For a discussion of Iron Age sites south of Cashel and on both sides of the River Suir, see (McQuade & Molloy 2012 (2012, 175–88).

Further to the south Danaher (2012, 79–92) has recently published a possible Iron Age homestead from Ballinaspig More in Co. Cork. To the north-east of Cashel a significant number of Iron Age sites were discovered on the M8 Cullahill to Cashel Road Project (see *Recent NRA Excavations* section above): the nearest contemporary sites being ephemeral settlement evidence on two sites in Coolkip, Co. Tipperary; pits and a hearth on each site were dated between cal. BC 770–48 cal. AD (Moore, Breen & Green 2009) and between cal. BC 200–128 cal. AD (Moore, Breen, Stevens & Green 2009). The massive Ballydavid enclosure constructed in the Middle/Late Bronze Age period also contained iron smelting and pits dated between cal. BC 765–127 cal. AD (Hardy, Green, & Stevens 2010); somewhat later in date but reflecting continuous settlement in the region, an Iron Age hearth discovered in Glashare Co. Kilkenny was dated between cal. BC 167–140 cal. AD (Hardy & Green 2009). McLaughlin & Conran (2008, 51–3) have recently described new Iron Age discoveries in north Munster. For further discussion on this period see Becker (2009 & 2012).

Undated features nearby

Stakehole [75] and pits [92] and [89] were located close to pit [71], and pit/tree-bole [95]. Pit [92] was filled with three different deposits. Two basal deposits of sandy silts of varying colours (90) and (91) were sealed by friable orange-grey silty clay with occasional charcoal

flecking and stones (98). Almost adjoining this pit was another, much shallower pit [89]; it was filled with orange-brown sandy silt with occasional charcoal flecking and small stones, almost identical to the upper fill noted in the nearby pit. Three closely-spaced pits [110], [120] and [122] were located *c.* 4 m north-east of pit [71]. Pit [110] was broadly similar to the adjacent pits, but at 0.34 m deep, was substantially deeper. It was filled with compacted grey-brown sandy silt with charcoal flecking (both of hazel and hazelnut shell). Upon excavation a possible post-pipe was revealed, inserted into its' northern side, closest to the adjacent pits. To the immediate north pit [122] was the larger of the pits here. It was filled with two deposits of brown silty clay, with charcoal and gravels/stones. Once the pit had been in-filled its western side was cut by pit [120], which was broadly similar in composition to the earlier pit. Pit [43] was located *c.* 4 m to the west and upon excavation the size and shape of this pit was not too dissimilar to those in the nearby pit cluster already described.

Features north of the Iron Age pit

A number of pits and postholes were identified north and north-east from Iron Age pit 71]. Three pits [102], [125] and [118] arced from south to north-east; postholes [115] and [145] were single features and, postholes [19], [39], [53] and [54] were located in a tight cluster *c.* 5 m east of the aforementioned pits. It was clear this was an area of intense activity but no recognisable structural layout could be determined on the ground.

Pit [102] had multiple fills varying from sterile silty sands to silty clays with occasional pebbles/small stones (103)–(107). The remaining features in this area were six postholes which were concentrated within a 9 m area. There was phased activity as posthole [53] had clearly cut through the side of an earlier posthole, [54]. As environmental analysis identified *c.* 10 hazelnut shells from posthole [53], it was likely both features were prehistoric.

Posthole [39] contained two deposits, (38) and (37). The upper deposit (37) probably represented all that remained of the original post, perhaps suggesting it burnt/decayed *in situ*? Posthole [19] was another example where a pre-prepared post had been placed upright into the ground. As with posthole [39] only ash charcoal was identified from its fill.

Pit [118] was two deposits which appeared to represent re-deposited natural so the pit may have been back-filled quickly after it was dug: the sterile nature of the fills was very apparent. The final pit in this area was the most northerly feature on the site, pit [130] was contained three deposits which appear to have been sporadically dumped from the

eastern side into the pit. The basal fill (129) was sealed in the centre by the deposition of (128), a similar fill except with occasional charcoal and pebbles. The similarity in both sandy silts suggested they may in fact reflect a single episode of deposition. Both deposits were partially sealed by (127) friable yellow-brown clayey silt, charcoal flecked and with occasional pebbles.

Three postholes [62], [65] and [68] formed in a Y-shaped arrangement were found together, *c.* 13 m east from Iron Age pit [71]. Posthole [68] formed the base of the 'Y'; posthole [65] contained only oak charcoal from each deposit this evidence would be compatible with using a strong timber like oak for such structural support. The last posthole [62] contained three deposits (61), (60) and (55). The basal fill (61) was friable brown-orange clayey sand with occasional charcoal flecks and stones, sealed by friable orange-brown silty sand with occasional charcoal flecking, (60). A distinct deposit of friable grey-brown silty sand with frequent charcoal flecking and ash, (55) had been inserted into the southern side of the cut; it is likely this burnt material was the remnants of the post itself, perhaps burnt *in situ*? Postholes [62] and [65] closely resembled one another and an association was obvious. This may support the notion that a Y-shaped structure–drying rack/utilitarian frame?–had been erected here.

Isolated posthole [06] had been driven straight into the ground having been cut to shape first, had stood upright before then being burnt *in situ*. Pits [79] and [50] were other isolated features: another isolated pit [81] had abutted the western side of the relict field boundary [02]; additional pits in this area would have destroyed when the field boundary was erected (see Site 9 Final Report for the erection of this boundary).

LATER MEDIEVAL DISCUSSION

Field Boundary

The former field boundary apparent on the mapping evidence and removed post-1950 was revealed. The ditches and bank formed part of an extant and extensive field boundary located close to the eastern edge of the dry ground with the land to the east being low lying and prone to seasonal flooding. This was the same feature as noted on sites 5–21 during excavation and it survived as an upstanding boundary in Boscabell townland to the south, on sites 15–19. This former boundary had existed until sometime after 1954 when it was removed to make the field into the large field that existed prior to excavation (compare Figure ix & Plate 1).

On either side of the removed bank traces of parallel drainage ditches and were revealed. One ditch was recut along its base by a field drain; as the same recut was also identified to the north on Site 11 and to the south on Site 21 Boscabell, this verified that the drain was *c.* 1 km in length. This field drain had channelled rainwater along the full course of the field drain, being a significant drainage feature in the landscape. The water flowed into the east-west orientated ditch/stream that formed the townland boundary with Boscabell and George's-Land (see 03E0480 & 03E0503 Final Reports). Excavations on nearby sites suggested this field boundary also acted as a routeway in later medieval times on the edge of this marginal land (Hughes & Ó'Droma 2011, 28–9). On Site 11 in the same field to the north, the evidence proved that the field boundary truncated the medieval structure, suggesting the boundary post-dated the 14th century at earliest (see 03E0346 Final Report). The remaining features on Site 13 could not be assigned to any period of activity.

CONCLUSION

All excavation works have finished in association with the N8 Cashel Bypass & N74 Link Road. The excavation undertaken on Site 13 (03E0378) identified no further archaeological activity and following the recording and excavation the road was built over the site. The earliest evidence on the site came from the Neolithic period, associated with contemporary activity to north and south. Refuse pits [83] and [86] were very significant features, located in the upper south-western, and dryer portion of the site. Between the two pits there were 258 individual sherds of Early Bronze Age Beaker pottery, adding considerably to the corpus of material from this period in the Cashel area. Both were found only 2 m from the edge of the road-take so there must be a significant Copper Age settlement upslope at Monadreela. There are abundant contemporary sites around Cashel too. Two other features dated from the end of the Late Bronze Age and the very beginnings of the Iron Age in the Cashel area, associated undoubtedly with contemporary activity in the surrounding fields. The remaining features on site were undated; some of these had characteristics commonly found in prehistoric features around Cashel, but other features were undoubtedly associated with the nearby vernacular homestead, excavated as Site 14.

RECOMMENDATIONS

Due to the archaeological discoveries along the edge of the Monadreela hillside, it is a recommendation in this report that the fields surrounding the site be subject to archaeological investigations prior to any proposed developments taking place. These fields should also be field-walked for research purposes should the land use ever revert to tillage. The fired clay pieces as detailed in Appendix 13 below should be sent to a metallurgical specialist to double-check the presence or not of slag.

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Appendix 1 Context Register

Context No.	Type	Description
[01]	Cut	E side of relict field boundary. Parallel to ditch [02]. Sharp break of slope at the top with the western side being more steeply cut than the shallower E side. Measured 4.26 m wide & 1.06 m deep & extended N-S through the site. Filled with (23)–(26), (28) & (29), contained field drain [46]
[02]	Cut	W side of relict field boundary. Parallel to ditch [01]. Sharp break of slope at the top with both sides being cut at a shallow angle. Measured 4.04 m wide, 0.74 m deep & extended N-S through the site. Filled with (31)–(33)
(03)	Fill	Fill of pit [04]. Compact orange-brown fine sandy silt with occasional charcoal flecking & limestone fragments throughout
[04]	Cut	Sub-rectangular pit with sharp break of slope at the top, V-shaped sides which taper to an uneven base. Measured 0.6 m long, 0.37 m wide & 0.2 m deep. Filled with (03)
(05)	Fill	Fill of posthole [06]. Loosely compacted greyish black clayey silt with occasional charcoal flecking & decayed sandstone fragments throughout
[06]	Cut	Sub-circular posthole with sharp break of slope at the top, straight steeply sloping sides with a sharp break of slope to a flattish base. Measured 0.28 m long, 0.26 m wide & 0.1 m deep. Filled with (05)
(07)	Fill	Fill of pit [08]. Firm greyish-brown fine sandy silt. Occasional charcoal flecking
[08]	Cut	Irregular ovoid pit with steep almost vertical edges to the north & an uneven base. Measured 1.3 m long, 0.56 m wide & 0.36 m deep. Filled with (07)
[09]	Cut	Sub-oval pit with slightly undercut edges & a concave irregular base. Measured 0.94 m long, 0.62 m wide & 0.44 m deep. Filled with (10) & (11)
(10)	Fill	Basal fill of pit [09]. Loose dark greyish-brown sandy silt with occasional charcoal flecking & small gravel pieces. Measured 0.82 m long, 0.45 m wide & 0.13 m deep
(11)	Fill	Primary fill of pit [09]. Loose orange-brown sandy silt with occasional angular sandstones & charcoal flecking. Measured 0.86 m long, 0.63 m wide & 0.26 m deep. Cut by pit [13]. Hazel charcoal dated to 1299–1059 cal. BC (UBA-13734)
(12)	Fill	Fill of pit [13]. Firm greyish-brown sandy silt with frequent charcoal flecking & occasional pieces of burnt/decayed sandstone. Measured 0.33 m long, 0.43 m wide & 0.09 m deep. Localised to E end of (14) only, above earlier filled-in pit [09]
[13]	Cut	Pit filled with (12) & (14). Measured 1 m long, 1.34 m wide & 0.04–0.09 m deep. Cut into W side of pit [09] once this pit had filled-up
(14)	Fill	Fill of pit [13]. Loose brown-orange sandy silt with occasional charcoal flecks & small rounded pebbles. Measured 1.19 m long, 0.95 m wide & 0.05 m deep. Contains (12)
(15)	Fill	Fill of pit [16]. Firm dark orange-brown fine sandy silt with occasional flecks of charcoal
[16]	Cut	Ovoid pit with irregular steep sides & an uneven base. Measured 0.65 m long, 0.38 m wide & 0.12 m deep. Filled with (15)
(17)	Fill	Primary fill of posthole [19]. Grey-brown silty sand with occasional charcoal flecks & small pebbles. Measured 0.23 m long, 0.23 m & 0.08 m deep. Above (18)
(18)	Fill	Basal fill of posthole [19]. Loose light grey-brown silty sand with occasional charcoal flecks & frequent decayed stones around sides & base. Measured 0.38 m long, 0.37 m wide & 0.36 m deep. Below (17)
[19]	Cut	Circular posthole with straight cut vertical sides & uneven base. Measured 0.38 m in diameter & 0.36 m deep. Filled with (18) & (17)
(20)	Fill	Fill of [21]. Firm orange-brown fine sandy silt with occasional charcoal flecks, small angular & rounded limestone fragments
[21]	Cut	Irregular shaped feature with steep sides down to an irregular base. Measured 1.04 m long, 0.6 m wide & 0.15 m deep. Filled with (20)
(22)	Deposit	Stone & clay bank between relict field boundary ditches [02] & [01]. Measured 0.76 m wide, exposed fully within site on an N-S axis. Below (27) & (57)
(23)	Fill	Upper fill of ditch [01]. Friable greyish-brown silty clay with frequent flecks of

		iron panning. Measured 2.02 m wide & 0.3 m deep. Contained one base sherd each of Stoneware 03E0378:14 & Pearlware 03E0378:17. Above (26) & (24)
(24)	Fill	Tertiary fill of ditch [01]. Friable dark greyish-brown sandy silt with frequent organic inclusions. Measured 1.84m wide by 0.2 m deep. Contained green glass fragment (not retained on site)
(25)	Fill	Lens within fill deposit (26) of ditch [01]. Firm orange-grey sandy clay with frequent small gravels. Measured 1.3m wide & 0.24 m deep
(26)	Fill	Secondary fill of ditch [01]. Medium/firm dark greyish-brown silty clay with occasional small gravel pieces. Measured 3.18 m wide & 0.78 m deep
(27)	Fill	Upper fill of bank (22). Friable pale greyish-brown silty clay with occasional organic fragments & small angular pebbles. Measured 2.74 m wide & 0.42 m deep
(28)	Fill	Primary fill of ditch [01]. Friable greyish-brown silty clay with moderate amounts of small angular & rounded pebbles. Measured 1.78 m wide & 0.3 m deep
(29)	Fill	Basal fill of ditch [01] at W side only. Friable yellow-orange brown coarse clay with occasional small angular & rounded pebbles plus some gravel pieces. Measured 0.6 m wide & 0.2 m deep. Below (28)
(30)	Fill	Fill of drain [46] at base of ditch [01]. Friable dark greyish-brown coarse clay with frequent small angular stones, larger pebbles & organic material (roots). Very water saturated. Measured 0.9 m wide & 0.32 m deep. Below (26)
(31)	Fill	Upper fill of ditch [02]. Friable brown silty clay with small sub-angular & rounded pebbles. Measured 3.6 m wide & 0.44 m deep. Contained a base sherd of Transfer printed ware 03E0378:02 & 23 animal bones (probably all of sheep). Above (32)
(32)	Fill	Primary fill of ditch [02]. Moderately compact mottled greyish-brown coarse clay with frequent iron staining, angular & rounded pebbles & degraded sandstones. Measured 3.2 m wide & 0.24 m deep. Above (33) & below (31)
(33)	Fill	Basal fill of ditch [02]. Compact orange brown coarse clay with occasional small sub-angular pebbles. Measured 1.92 m wide by 0.22 m deep. Below (31) & (32)
[34]	Cut	Sub-oval pit with concave sides & irregular base. Measured 0.59 m long, 0.33 m wide & 0.18 m deep. Filled with (35) & (36)
(35)	Fill	Basal fill of pit [34]. Friable mottled greyish-brown sandy silt with occasional very small gravel pieces close to the interface with the natural. Measured 0.55 m long, 0.19 m wide & 0.04 m deep. Below (36)
(36)	Fill	Primary fill of pit [34]. Friable greyish-brown sandy silt with occasional small sandstone pebbles plus some decayed mudstone. Measured 0.55 m long, 0.33 m wide & 0.12 m deep. Above (35)
(37)	Fill	Primary fill of posthole [39]. Friable dark grey-brown silty sand with a moderate amount of charcoal, some decayed sandstone & occasional small pebbles. Measured 0.41 m long, 0.35 m wide & 0.11 m deep. Above (38)
(38)	Fill	Basal fill of posthole [39]. Greyish-orange silty sand with occasional charcoal flecks & a moderate amount of small stones, pebbles & decayed sandstone. Measured 0.41 m long, 0.35 m wide & 0.18 m deep. Below (37)
[39]	Cut	Sub-circular posthole with straight sides down to an irregular base, W edge at base stepped. Measured 0.41 m long, 0.38 m wide & 0.32 m. Filled with (38) & (37)
[40]	Cut	Sub-circular pit with irregular concave sides down to uneven base. Measured 0.74 m long, 0.64 m wide & 0.3 m deep. Filled with (41)
(41)	Fill	Fill of pit [40]. Friable greyish-brown sandy silt with occasional charcoal flecking & angular sandstones
(42)	Fill	Fill of pit [43]. Friable orange-brown silty sand with occasional fragments of small rounded & angular limestones
[43]	Cut	Sub-circular pit with steep sides leading to a flattish base. Measured 0.58 m long, 0.52 m wide & 0.22 m deep. Filled with (42)
(44)	Fill	Fill of posthole [45]. Friable yellow-grey sandy clay with frequent small stones & pebbles many of which were decayed
[45]	Cut	Sub-rectangular posthole with slightly concave sides & flat base. Measured 0.58 m long, 0.46 m wide & 0.22 m deep. Filled with (44)
[46]	Cut	Field drain cut into the base of ditch [01], steep-sided & flat base, filled with

		(30)
(47)	Deposit	Topsoil W of relict field boundary ditches [01]/[02]. Friable mid brown sandy clay with frequent fibrous organic (root) inclusions & occasional modern ceramic inclusions. Varies in depth between 0.15 m at the eastern end of site to 0.7 m at the western end of site. Contained modern ceramics (not retained on site) & a flint blade 03E0378:13
(48)	Deposit	Subsoil W of relict field boundary ditches [01]/[02]. Orange-brown sandy, stony clay
(49)	Fill	Fill of pit [50]. Friable orange-brown clayey silt with occasional charcoal flecking & small pebbles
[50]	Cut	Sub-oval pit with steep S side & gradual N side, measuring 0.48 m long, 0.5 m wide & 0.1 m deep. Filled with (49)
(51)	Fill	Fill of posthole [53]. Friable dark grey-brown silty sand with frequent small gravels, larger decayed stones & moderate amounts of charcoal flecking
(52)	Fill	Fill of posthole [54]. Orange-brown sand with occasional flecks of decayed stones
[53]	Cut	Semi-circular posthole with steeply sloping edges down to a pointed base. Measured 0.36 m long, 0.19 m wide & 0.16 m deep. Filled with (51). Cuts posthole [54]
[54]	Cut	Sub-rectangular posthole with steep sides & gently sloping base. Measured 0.45 m long, 0.39 m wide & 0.1 m. Filled with (52). Cut by posthole [53]
(55)	Fill	Upper fill of posthole [62]. Friable grey-brown silty sand with frequent charcoal flecking & ash. Measured 0.3 m long, 0.19 m wide & 0.8 m deep. Above (60)
(56)	Deposit	Topsoil E of relict field boundary ditches [01]/ [02], dark brown peaty clay. Above [04], [08], [16], (23) & (24)
(57)	Deposit	Upper fill of bank (22). Friable dark brown silty clay with frequent organic inclusions & small angular stones at the base. Measured 2.92 m wide & 0.18 m deep. Above (58) & below (27) & (47)
(58)	Fill	Fill of drain [59]. Friable greyish-brown silty clay with frequent large & small angular & rounded stones. Contained blue glass fragment (not retained on site). Below (57)
[59]	Cut	Field drain cut into relict field boundary bank (22), N-S orientated with regular sloping edges down to flattish base. Measured 1.01 m wide & 0.24 m deep. Filled with (58), below (57)
(60)	Fill	Primary fill of posthole [62]. Friable orange-brown silty sand with occasional charcoal flecking. Measured 0.42 m long, 0.35 m wide & 0.11 m deep. Below (55), above (61)
(61)	Fill	Basal fill of posthole [62]. Friable brown-orange clayey sand with occasional charcoal flecks & stones. Measured 0.37 m long, 0.25 m wide & 0.04 m. Below (60)
[62]	Cut	Sub-rectangular posthole with steeply sloping sides & a flat base. Measured 0.41 m long, 0.39 m wide & 0.17 m deep. Filled with (61), (60) & (55)
(63)	Fill	Primary fill of pit [65]. Orange-brown silty sand with occasional charcoal flecking, ash patches & small stones. Measured 0.36 m long, 0.29 m wide & 0.11 m deep. Above (64)
(64)	Fill	Basal fill of pit [65]. Friable dark orange-brown clayey sand with occasional charcoal flecking. Measured 0.36 m long, 0.29 m wide & 0.01–0.04 m deep. Below (63)
[65]	Cut	Circular posthole with gently sloping W side & steeply cut E side down to irregular base. Measured 0.35 m in diameter & 0.15 m deep. Filled with (64) & (63)
(66)	Fill	Primary fill of posthole [68]. Friable orange-brown clayey sand with occasional charcoal flecks & small stones. Measured 0.6 m long, 0.46 m wide & 0.19 m deep. Above (67)
(67)	Fill	Basal fill of posthole [68]. Friable grey-brown clay with occasional charcoal flecking. Measured 0.6 m long, 0.46 m wide by 0.05 m deep. Below (66)
[68]	Cut	Sub-circular posthole with the W side sloping gently & the E side, being more acutely cut down to roughly V-shaped base. Measured 0.56 m long, 0.48 m wide & 0.29 m deep. Filled with (67) & (66)
[69]	Cut	Sub-oval pit with vertical sides on the W, S & E with the N side concave down to a W/E sloping base. Measured 1 m long, 0.89 m wide by 0.3 m deep. Filled

		with (70)
(70)	Fill	Fill of pit [69]. Friable brown silt with occasional charcoal flecking with angular & rounded pebbles, degraded sandstones & roots
[71]	Cut	Sub-circular pit with gently sloping sides & regular concave base. Measured 0.4 m long, 0.36 m wide & 0.12 m deep. Filled with (72), (73) & (74)
(72)	Fill	Basal fill of pit [71]. Friable brown sandy silt with occasional charcoal flecking. Measured 0.26 m long, 0.18 m wide & 0.02 m deep. Below (73) & (74). Cherry-type charcoal dated to 806–598 cal. BC (UBA-13735)
(73)	Fill	Primary fill of pit [71]. Firm dark brown-black mottled sandy silt with frequent chunks of charcoal & gravel. Measured 0.32 m long, 0.11 m wide & 0.1 m deep. Below (74), above (72)
(74)	Fill	Upper fill of pit [71] at E side only. A fire baked pink-red sandy silt with occasional charcoal flecking. Measured 0.2 m long, 0.13 m wide & 0.05 m deep. Above (73)
[75]	Cut	Circular stakehole with steeply sloping northern edge with the remaining being more gradually cut down to concave base. Measured 0.15 m diameter & 0.15 m deep. Filled with (76)
(76)	Fill	Fill of stakehole [75]. Friable greyish-brown sandy silt with occasional charcoal flecks & small pebbles
(77)	Fill	Primary fill of pit [79]. Friable orange-brown sandy silt with a moderate amount of charcoal flecking & the occasional pebble. Measured 0.51 m long, 0.43 m wide & 0.11 m deep. Above (78)
(78)	Fill	Basal fill of pit [79]. Orange-brown clayey silt with occasional charcoal flecking & small pebbles. Measured 0.44 m long, 0.38 m wide & 0.05 m deep. Below (77)
[79]	Cut	Semi-circular pit with steeply cut edges down to irregular base. Measured 0.56 m long, 0.55 m wide & 0.15 m deep. Filled with (78) & (77)
(80)	Fill	Basal fill of pit [81]. Firm yellow silty sand with occasional charcoal flecking. Measured 0.11 m deep. Below (82)
[81]	Cut	Sub-oval shaped pit with gently sloping N &W sides with the remainder being more steeply cut down to flattish base. Measured 0.86 m long, 0.51 m wide by 0.17 m deep. Filled with (80) & (82)
(82)	Fill	Primary fill of pit [81]. Malleable yellow-grey clayey sand with frequent charcoal flecking & occasional small pebbles & stones. Measured 0.06 deep. Above (80)
[83]	Cut	Sub-oval pit with steeply cut edges & possible undercut on the southern side all down to irregular base. Measured 1.41 m long, 1.02 m wide & 0.3 m deep. Filled with (85), (97) & (84)
(84)	Fill	Fill of pit [83]. Friable brown silt with mottled grey-orange patches & frequent charcoal flecking & organic material. Measured 1.23 m wide by 0.22 m deep. Above (85) & (97)
(85)	Fill	Basal fill of pit [83], containing lens (97) at S-E corner. A layer of *in situ* burning with multiple sherds of Bronze Age pottery, polished stone axe 03E0378:20 cremated bones & charred hazelnut shells. Below (84). Hazel charcoal dated to 2457–2204 cal. BC (UBA-13903)
[86]	Cut	Sub-circular pit with undercut W & E sides with the remainder being cut vertically down to an uneven base that slopes down to the S. Measured 0.92 m long, 0.9 m wide & 0.4 m deep. Filled with (99), (100), (108) & (87)
(87)	Fill	Secondary fill of pit [86]. Friable dark brown silt with frequent charcoal flecks & charred wood in a distinctive lens. Occasional small angular pebbles & degraded sandstones. Measured 0.66 m wide & 0.14 m deep. Above (99) & (100), may contain (108) lens. Ash charcoal dated to 2467–2236 cal. BC (UBA-13737)
(88)	Fill	Fill of pit [89]. Orange-brown sandy silt with occasional charcoal flecking & small stones
[89]	Cut	Sub-oval pit with steeply cut N-W & S-E sides with the remainder being more gradually cut to a base which slopes down to the south from N. Measured 0.26 m long, 0.16 m wide & 0.1 m deep. Filled with (88)
(90)	Fill	Basal fill of pit [92]. Friable mottled white-orange-brown sandy silt with moderate amounts of charcoal & pebbles. Below (98)
(91)	Fill	Basal fill of pit [92]. Friable orange-brown sandy silt with frequent small

		pebbles & occasional charcoal flecking. Below (98)
[92]	Cut	Sub-oval pit, steep edges except at S-E which was cut more gradually down to a concave base. Measured 0.57 m long, 0.38 m wide & 0.38 m deep. Filled with (98), (90) & (91)
(93)	Fill	Fill of [95]. Friable orange-brown sandy silt with moderate charcoal flecking & occasional small stones. One small fresh laminar flint blade 03E0378:12 was recovered from this fill. Measured 1.15 m long, 0.59 m wide & 0.2 m deep. Above (94)
(94)	Fill	Fill of [95]. Friable orange-brown clayey silt with frequent charcoal flecking & patches of oxidised clay towards the base of the feature. Measured 0.7 m long, 0.59 m wide & 0.16–0.2 m deep. Below (93), contains (101) lens. Alder charcoal dated to 2484–2236 cal. BC (UBA-13736)
[95]	Cut	Irregular pit/tree-bole with steep concave cut sides down to a flattish base. Measured 1.15 m long, 0.59 m wide & 0.28 m deep. Filled with (93), (94) & (101)
(96)	Deposit	Natural E of relict field boundary ditches [01]/[02], yellowish grey/white marl prone to constant water-logging
(97)	Fill	Localised deposit of (85) in S-E corner of pit [83]. Red ash & burnt clay containing the greatest concentration of cremated bones noted within the pit
(98)	Fill	Upper fill of pit [92]. Orange-grey silty clay with occasional charcoal flecking & stones. Above (90) & (91)
(99)	Fill	Basal fill of pit [86]. Friable dark brown silt with occasional small pebbles, charcoal & infrequent large stones. Below (87) & (100). Alder charcoal dated to 2334–2140 cal. BC (UBA-13902)
(100)	Fill	Primary fill of pit [86]. Compact yellow-brown clay with occasional charcoal flecks & angular pebbles throughout. Re-deposited natural noted at corner of pit. Below (87) & (108), above (99)
(101)	Fill	Lens of white mottled silt contained within deposit (94) of [95]
[102]	Cut	Sub-circular pit with all edges sloping down gradually to an irregular concave base. Measured 0.91 m long, 0.89 m wide & 0.23 m deep. Filled with deposits (103)–(107)
(103)	Fill	Fill of pit [102]. Friable dark brown silty clay with frequent small gravels & some larger pebbles. Measured 0.47 m wide & 0.19 m deep
(104)	Fill	Fill of pit [102]. Brown sandy silt with occasional gravel pieces & decayed sandstone. Measured 0.14 m wide & 0.19 m deep
(105)	Fill	Fill of pit [102]. Greyish-brown sandy silt with frequent large pebbles & gravel. Measured 0.09 m wide & 0.19 m deep
(106)	Fill	Fill of pit [102]. Orange-brown sandy silt with frequent gravel pieces. Measured 0.28 m wide & 0.19 m deep
(107)	Fill	Fill of pit [102]. Friable brown silty clay with occasional gravel pieces & some larger stones. Measured 0.13 m wide & 0.12 m deep
(108)	Fill	Lens noted within pit [86] at corner only. Mottled ashy/lime re-deposited material with occasional charcoal flecks. Above & associated with (100), below/within (87)
(109)	Fill	Primary fill of pit [122]. Friable brown silty clay with occasional charcoal flecking & some smaller sandstones & limestones. Above (111)
[110]	Cut	Sub-oval pit with shallow cut edges to an uneven base. Measured 0.88 m long, 0.48 m wide & 0.12 m deep. Filled with (121)
(111)	Fill	Basal fill of pit [122]. Brown silty clay with frequent charcoal flecks & rounded gravels. Below (109)
(112)	Fill	Re-deposited material noted within fill (15) of pit [16], yellow-brown peaty clay
113		Not used
(114)	Fill	Fill of pit [115]. Friable grey-brown clayey silt with occasional charcoal flecks
[115]	Cut	Sub-circular posthole with slightly undercut S side with the remainder being cut almost vertically to a concave base. Measured 0.57 m long, 0.55 m wide & 0.31 m. Filled with (114)
(116)	Fill	Primary fill of pit [118]. Compact brown-orange sandy clay with frequent small to medium stones & pebbles. Measured 0.12 m deep. Above (117)
(117)	Fill	Basal fill of pit [118]. Friable yellow-brown sandy clay with frequent small to medium decayed stones. Measured 0.2 m deep. Below (116)
[118]	Cut	Irregularly-shaped pit with gradually sloping sides apart from the E side which

		is cut more acutely to undulating base. Measured 1.6 m long, 1.54 m wide & 0.32 m. Filled with (117) & (116)
(119)	Fill	Fill of pit [120]. Firm light greyish-brown sandy silt with occasional charcoal flecking, gravel & larger angular sandstone pebbles
[120]	Cut	Sub-oval pit with shallow cut edges & irregular concave base. Measured 0.81 m long, 0.68 m wide & 0.1 m deep. Filled with (119). Truncated by pit [122] on W side
(121)	Fill	Fill of pit [110]. A variable compacted grey-brown sandy silt with occasional charcoal flecking & angular sandstones
[122]	Cut	Sub-oval pit with gradually cut top edges leading to a flat base that drops sharply to the north down to concave base. Measured 0.71 m long, 0.62 m wide & 0.34 m. Filled with (111) & (109). Cuts W side of pit [120]
(123)	Fill	Fill of pit [124]. Friable yellow-brown clayey silt with occasional mottling patches & iron panning
[124]	Cut	Sub-circular pit with the W & S sides being steeply cut with the remainder being more gradual. Measured 0.5 m long, 0.46 m wide & 0.25 m. Filled with (123)
[125]	Cut	Sub-circular pit with steep sides & concave base. Measured 0.9 m long, 0.7 m wide & 0.2 m deep. Filled with (126)
(126)	Fill	Fill of pit [125]. Firm greyish-brown sandy silt with occasional charcoal flecks
(127)	Fill	Upper fill of pit [130]. Friable yellow-brown clayey silt with moderate occurrence of charcoal & occasional pebbles. Measured 0.5 m long, 0.38 m wide & 0.09 m deep. Above (129) & (128)
(128)	Fill	Primary fill of pit [130]. Friable yellow-grey brown sandy silt with occasional charcoal & pebbles. Measured 0.4 m long, 0.35 m wide & 0.1 m deep. Above (129) & below (127)
(129)	Fill	Basal fill of pit [130]. Friable yellow-grey brown sandy silt with moderate amount of charcoal with small pebbles & stones. Measured 0.72 m long, 0.3 m wide & 0.16 m deep. Below (127) & (128)
[130]	Cut	Sub-rectangular pit with all edges gradually cut apart from the southern edge which was more steeply excavated down to concave base. Measured 0.81 m long, 0.45 m wide & 0.21 m deep. Filled with (129), (128) & (127)

Appendix 2 Finds Register

Find No.	Specialist No.	Context	Material	Type	Description
03E0378:01	85.1 Vessel 1	[83](85)	Ceramic	Pottery	Sherd of Late Neolithic/Early Bronze Age Beaker pottery.
03E0378:02	N/A	[02], (31)	Ceramic	Pottery	Transfer printed ware. Base sherd from a plate. Dates to 19th century.
03E0378:03	85.15 Vessel 4	[83](85)	Ceramic	Pottery	Sherd of Late Neolithic/Early Bronze Age Beaker pottery.
03E0378:04	85.13 Vessel 2	[83](85)	Ceramic	Pottery	Neck/belly sherd of Late Neolithic/Early Bronze Age Beaker pottery.
03E0378:05	85.187	[83](85)	Clay	Burnt clay	
03E0378:06	85.92	[83](85)	Ceramic	Pottery	Body sherd of Late Neolithic/Early Bronze Age Beaker pottery.
03E0378:07	85.88	[83](85)	Ceramic	Pottery	Body sherd of Late Neolithic/Early Bronze Age Beaker pottery.
03E0378:08	99.1 Vessel 11	[86](99)	Ceramic	Pottery	Neck sherd of Late Neolithic/Early Bronze Age Beaker pottery.
03E0378:09	85.8 Vessel 2	[83](85)	Ceramic	Pottery	Rim sherd of Late Neolithic/Early Bronze Age Beaker pottery.
03E0378:10	85.89	[83](85)	Ceramic	Pottery	Body sherd of Late Neolithic/Early Bronze Age Beaker pottery.
03E0378:11	85.93	[83](85)	Ceramic	Pottery	Body sherd of Late Neolithic/Early Bronze Age Beaker pottery.
03E0378:12	N/A	[95](93)	Flint	Blade	Flint blade.
03E0378:13	N/A	(47) Topsoil	Flint	Blade	Flint blade.
03E0378:14	N/A	[01](23)	Ceramic	Pottery	Stoneware. Base sherd of bottle. Beige fabric with beige glaze on both sides. Dates to 19th to 20th century.
03E0378:15	N/A	[83](84)/(85)	Stone	Object	Quartz stone
03E0378:16	N/A	[83](84)/(85)	Stone	Hammerstone	Possible hammerstone.
03E0378:17	N/A	[01](23)	Ceramic	Pottery	Pearlware pottery. Base sherd from a bowl. White fabric, white glaze. Dates to 19th century.
03E0378:18	N/A	[83](85)	Flint	Flake	Flint flake
03E0378:19	N/A	[83](85)	Flint	Flake	Flint cortical flake.
03E0378:20	N/A	[83](85)	Stone	Axehead	Polished stone axe head.
03E0378:21	85.23 Vessel 7	[83](85)	Ceramic	Pottery	Rim sherd of Late Neolithic/Early Bronze Age Beaker pottery.
03E0378:22	85.50, Vessel 8	[83](85)	Ceramic	Pottery	Body sherd of Late Neolithic/Early Bronze Age Beaker pottery.

03E0378:23	N/A	[86] (99)	Flint	Blade	Flint blade.
03E0378:24	N/A	[86] (99)	Flint	Flake	Flint flake fragment.
03E0378:25	85.7 Vessel 3	[83](85)	Ceramic	Pottery	Neck sherd of Late Neolithic/Early Bronze Age Beaker pottery.
03E0378:26	N/A	[83](85)	Flint	Flake	Small flint flake.
03E0378:27	85/108.237	[83](85)	Ceramic	Pottery	Neck sherd of Late Neolithic/Early Bronze Age Beaker pottery.
03E0378:28	N/A	[83](85)	Flint	Flake	Small flint flake.
03E0378:29	85.91	[83](85)	Ceramic	Pottery	Body sherd of Late Neolithic/Early Bronze Age Beaker pottery.
03E0378:30	85.188	[83](85)	Clay	Burnt clay	Burnt clay.
03E0378:31	85.189	[83](85)	Clay	Burnt clay	Burnt clay.
03E0378:32	85.2 Vessel 1	[83](85)	Ceramic	Pottery	Neck sherd of Late Neolithic/Early Bronze Age Beaker pottery.
03E0378:33	85.3 Vessel 1	[83](85)	Ceramic	Pottery	Body sherd of Late Neolithic/Early Bronze Age Beaker pottery.
03E0378:34	85.33 Vessel 8	[83](85)	Ceramic	Pottery	Body sherd of Late Neolithic/Early Bronze Age Beaker pottery.
03E0378:35	85.36 Vessel 8	[83](85)	Ceramic	Pottery	Body sherd of Late Neolithic/Early Bronze Age Beaker pottery.
03E0378:36	85.6 Vessel 1	[83](85)	Ceramic	Pottery	Body sherd of Late Neolithic/Early Bronze Age Beaker pottery.
03E0378:37	85.9 Vessel 2	[83](85)	Ceramic	Pottery	Base-angle sherd of Late Neolithic/Early Bronze Age Beaker pottery.
03E0378:38	85.12 Vessel 2	[83](85)	Ceramic	Pottery	Neck/belly sherd of Late Neolithic/Early Bronze Age Beaker pottery.
03E0378:39	85.39 Vessel 8	[83](85)	Ceramic	Pottery	Neck sherd of Late Neolithic/Early Bronze Age Beaker pottery.
03E0378:40	85.10 Vessel 2	[83](85)	Ceramic	Pottery	Body sherd of Late Neolithic/Early Bronze Age Beaker pottery.
03E0378:41	85.11 Vessel 2	[83](85)	Ceramic	Pottery	Body sherd of Late Neolithic/Early Bronze Age Beaker pottery.

03E0378:42	85.14 Vessel 2	[83](85)	Ceramic	Pottery	Body sherd of Late Neolithic/Early Bronze Age Beaker pottery
03E0378:43	85.16 Vessel 4	[83](85)	Ceramic	Pottery	Sherd of Late Neolithic/Early Bronze Age Beaker pottery.
03E0378:44	85.17 Vessel 4	[83](85)	Ceramic	Pottery	Sherd of Late Neolithic/Early Bronze Age Beaker pottery.
03E0378:45	85.18 Vessel 4	[83](85)	Ceramic	Pottery	Sherd of Late Neolithic/Early Bronze Age Beaker pottery.
03E0378:46	85.24 Vessel 5	[83](85)	Ceramic	Pottery	Rim sherd of Late Neolithic/Early Bronze Age Beaker pottery.
03E0378:47	85.28 Vessel 5	[83](85)	Ceramic	Pottery	Rim sherd of Late Neolithic/Early Bronze Age Beaker pottery.
03E0378:48	85.25 Vessel 5	[83](85)	Ceramic	Pottery	Neck sherd of Late Neolithic/Early Bronze Age Beaker pottery.
03E0378:49	85.26 Vessel 5	[83](85)	Ceramic	Pottery	Body sherd of Late Neolithic/Early Bronze Age Beaker pottery.
03E0378:50	85.27 Vessel 5	[83](85)	Ceramic	Pottery	Body sherd of Late Neolithic/Early Bronze Age Beaker pottery.
03E0378:51	85.86 Vessel 5	[83](85)	Ceramic	Pottery	Body sherd of Late Neolithic/Early Bronze Age Beaker pottery
03E0378:52	85.87 Vessel 5	[83](85)	Ceramic	Pottery	Body sherd of Late Neolithic/Early Bronze Age Beaker pottery.
03E0378:53	85.29a Vessel 6	[83](85)	Ceramic	Pottery	Rim sherd of Late Neolithic/Early Bronze Age Beaker pottery.
03E0378:54	85.29b Vessel 6	[83](85)	Ceramic	Pottery	Rim sherd of Late Neolithic/Early Bronze Age Beaker pottery.
03E0378:55	85.74 Vessel 9	[83](85)	Ceramic	Pottery	Rim sherd of Late Neolithic/Early Bronze Age Beaker pottery.
03E0378:56	85.75a Vessel 9	[83](85)	Ceramic	Pottery	Neck sherd of Late Neolithic/Early Bronze Age Beaker pottery.
03E0378:57	85.75b Vessel 9	[83](85)	Ceramic	Pottery	Neck sherd of Late Neolithic/Early Bronze Age Beaker pottery.

03E0378:58	85.76a Vessel 10	[83](85)	Ceramic	Pottery	Neck/body sherd of Late Neolithic/Early Bronze Age Beaker pottery.
03E0378:59	85.76b Vessel 10	[83](85)	Ceramic	Pottery	Neck/body sherd of Late Neolithic/Early Bronze Age Beaker pottery.
03E0378:60	85.77 Vessel 10	[83](85)	Ceramic	Pottery	Neck sherd of Late Neolithic/Early Bronze Age Beaker pottery.
03E0378:61	85.78 Vessel 10	[83](85)	Ceramic	Pottery	Neck/body sherd of Late Neolithic/Early Bronze Age Beaker pottery.
03E0378:62	85.79	[83](85)	Ceramic	Pottery	Base-angle sherd of Late Neolithic/Early Bronze Age Beaker pottery.
03E0378:63	85.8	[83](85)	Ceramic	Pottery	Base-angle sherd of Late Neolithic/Early Bronze Age Beaker pottery.
03E0378:64	85.3	[83](85)	Ceramic	Pottery	Rim sherd of Late Neolithic/Early Bronze Age Beaker pottery.
03E0378:65	99.2 Vessel 11	[86](99)	Ceramic	Pottery	Neck sherd of Late Neolithic/Early Bronze Age Beaker pottery.
03E0378:66	99.3 Vessel 11	[86](99)	Ceramic	Pottery	Neck sherd of Late Neolithic/Early Bronze Age Beaker pottery.
03E0378:67	99.4 Vessel 11	[86](99)	Ceramic	Pottery	Neck sherd of Late Neolithic/Early Bronze Age Beaker pottery.
03E0378:68	99.5 Vessel 11	[86](99)	Ceramic	Pottery	Body sherd of Late Neolithic/Early Bronze Age Beaker pottery.
03E0378:69	99.6 Vessel 11	[86](99)	Ceramic	Pottery	Body sherd of Late Neolithic/Early Bronze Age Beaker pottery.
03E0378:70	99.7 Vessel 11	[86](99)	Ceramic	Pottery	Body sherd of Late Neolithic/Early Bronze Age Beaker pottery.
03E0378:71	99.8 Vessel 11	[86](99)	Ceramic	Pottery	Body sherd of Late Neolithic/Early Bronze Age Beaker pottery.
03E0378:72	99.9 Vessel 11	[86](99)	Ceramic	Pottery	Body sherd of Late Neolithic/Early Bronze Age Beaker pottery.
03E0378:73	99.10 Vessel 11	[86](99)	Ceramic	Pottery	Body sherd of Late Neolithic/Early Bronze Age Beaker pottery.
03E0378:74	99.19	[86](99)	Ceramic	Pottery	Neck sherd of Late Neolithic/Early Bronze Age Beaker pottery.

03E0378:75	99.11 Vessel 12	[86](99)	Ceramic	Pottery	Base-angle sherd of Late Neolithic/Early Bronze Age Beaker pottery.
03E0378:76	99.12 Vessel 12	[86](99)	Ceramic	Pottery	Base-angle sherd of Late Neolithic/Early Bronze Age Beaker pottery.
03E0378:77	99.13 Vessel 12	[86](99)	Ceramic	Pottery	Base-angle sherd of Late Neolithic/Early Bronze Age Beaker pottery.
03E0378:78	99.16 Vessel 12	[86](99)	Ceramic	Pottery	Base-angle sherd of Late Neolithic/Early Bronze Age Beaker pottery.
03E0378:79	99.14 Vessel 12	[86](99)	Ceramic	Pottery	Body sherd of Late Neolithic/Early Bronze Age Beaker pottery.
03E0378:80	99.15 Vessel 12	[86](99)	Ceramic	Pottery	Body sherd of Late Neolithic/Early Bronze Age Beaker pottery.
03E0378:81	99.17 Vessel 12	[86](99)	Ceramic	Pottery	Body sherd of Late Neolithic/Early Bronze Age Beaker pottery.
03E0378:82	99.18 Vessel 12	[86](99)	Ceramic	Pottery	Body sherd of Late Neolithic/Early Bronze Age Beaker pottery.
03E0378:83	99.61 Vessel 12	[86](99)	Ceramic	Pottery	Body sherd of Late Neolithic/Early Bronze Age Beaker pottery.
03E0378:84	99.6	[86](99)	Clay	Burnt clay	Burnt clay.
03E0378:85	99.2	[86](99)	Ceramic	Pottery	Body sherd of Late Neolithic/Early Bronze Age Beaker pottery.
03E0378:86	99.21	[86](99)	Ceramic	Pottery	Body sherd of Late Neolithic/Early Bronze Age Beaker pottery.
03E0378:87	99.22	[86](99)	Ceramic	Pottery	Body sherd of Late Neolithic/Early Bronze Age Beaker pottery.
03E0378:88	99.23	[86](99)	Ceramic	Pottery	Body sherd of Late Neolithic/Early Bronze Age Beaker pottery.
03E0378:89	99.24	[86](99)	Ceramic	Pottery	Body sherd of Late Neolithic/Early Bronze Age Beaker pottery.
03E0378:90	99.25	[86](99)	Ceramic	Pottery	Fragment of Late Neolithic/Early Bronze Age Beaker.
03E0378:91	99.26	[86](99)	Ceramic	Pottery	Fragment of Late Neolithic/Early Bronze Age Beaker.
03E0378:92	99.27	[86](99)	Ceramic	Pottery	Fragment of Late Neolithic/Early Bronze Age Beaker.
03E0378:93	99.28	[86](99)	Ceramic	Pottery	Crumb of Late Neolithic/Early Bronze Age Beaker.
03E0378:94	99.29	[86](99)	Ceramic	Pottery	Crumb of Late Neolithic/Early Bronze Age Beaker.
03E0378:95	99.30	[86](99)	Ceramic	Pottery	Crumb of Late Neolithic/Early Bronze Age Beaker.

03E0378:96	99.31	[86](99)	Ceramic	Pottery	Crumb of Late Neolithic/Early Bronze Age Beaker.
03E0378:97	99.32	[86](99)	Ceramic	Pottery	Crumb of Late Neolithic/Early Bronze Age Beaker.
03E0378:98	99.33	[86](99)	Ceramic	Pottery	Crumb of Late Neolithic/Early Bronze Age Beaker.
03E0378:99	99.34	[86](99)	Ceramic	Pottery	Crumb of Late Neolithic/Early Bronze Age Beaker.
03E0378:100	99.35	[86](99)	Ceramic	Pottery	Crumb of Late Neolithic/Early Bronze Age Beaker.
03E0378:101	99.36	[86](99)	Ceramic	Pottery	Crumb of Late Neolithic/Early Bronze Age Beaker.
03E0378:102	99.37	[86](99)	Ceramic	Pottery	Crumb of Late Neolithic/Early Bronze Age Beaker.
03E0378:103	99.38	[86](99)	Ceramic	Pottery	Crumb of Late Neolithic/Early Bronze Age Beaker.
03E0378:104	99.39	[86](99)	Ceramic	Pottery	Crumb of Late Neolithic/Early Bronze Age Beaker.
03E0378:105	99.40	[86](99)	Ceramic	Pottery	Crumb of Late Neolithic/Early Bronze Age Beaker.
03E0378:106	99.41	[86](99)	Ceramic	Pottery	Crumb of Late Neolithic/Early Bronze Age Beaker.
03E0378:107	99.42	[86](99)	Ceramic	Pottery	Crumb of Late Neolithic/Early Bronze Age Beaker.
03E0378:108	99.43	[86](99)	Ceramic	Pottery	Crumb of Late Neolithic/Early Bronze Age Beaker.
03E0378:109	99.44	[86](99)	Ceramic	Pottery	Crumb of Late Neolithic/Early Bronze Age Beaker.
03E0378:110	99.45	[86](99)	Ceramic	Pottery	Crumb of Late Neolithic/Early Bronze Age Beaker.
03E0378:111	99.46	[86](99)	Ceramic	Pottery	Crumb of Late Neolithic/Early Bronze Age Beaker.
03E0378:112	99.47	[86](99)	Ceramic	Pottery	Crumb of Late Neolithic/Early Bronze Age Beaker.
03E0378:113	99.48	[86](99)	Ceramic	Pottery	Crumb of Late Neolithic/Early Bronze Age Beaker.
03E0378:114	99.49	[86](99)	Ceramic	Pottery	Crumb of Late Neolithic/Early Bronze Age Beaker.
03E0378:115	99.50	[86](99)	Ceramic	Pottery	Crumb of Late Neolithic/Early Bronze Age Beaker.
03E0378:116	99.51	[86](99)	Ceramic	Pottery	Crumb of Late Neolithic/Early Bronze Age Beaker.
03E0378:117	99.52	[86](99)	Ceramic	Pottery	Crumb of Late Neolithic/Early Bronze Age Beaker.
03E0378:118	99.53	[86](99)	Ceramic	Pottery	Crumb of Late Neolithic/Early Bronze Age Beaker.
03E0378:119	99.54	[86](99)	Ceramic	Pottery	Crumb of Late Neolithic/Early Bronze Age Beaker.
03E0378:120	99.55	[86](99)	Ceramic	Pottery	Crumb of Late Neolithic/Early Bronze Age Beaker.
03E0378:121	99.56	[86](99)	Ceramic	Pottery	Crumb of Late Neolithic/Early Bronze Age Beaker.
03E0378:122	99.57	[86](99)	Ceramic	Pottery	Crumb of Late Neolithic/Early Bronze Age Beaker.
03E0378:123	99.58	[86](99)	Ceramic	Pottery	Crumb of Late Neolithic/Early Bronze Age Beaker.

03E0378:124	99.59	[86](99)	Ceramic	Pottery	Crumb of Late Neolithic/Early Bronze Age Beaker.
03E0378:125	85.25a Vessel 6	[83](85)	Ceramic	Pottery	Neck sherd of Late Neolithic/Early Bronze Age Beaker pottery.
03E0378:126	85.25b Vessel 6	[83](85)	Ceramic	Pottery	Neck sherd of Late Neolithic/Early Bronze Age Beaker pottery.
03E0378:127	85.26 Vessel 6	[83](85)	Ceramic	Pottery	Body sherd of Late Neolithic/Early Bronze Age Beaker pottery.
03E0378:128	85.27 Vessel 6	[83](85)	Ceramic	Pottery	Body sherd of Late Neolithic/Early Bronze Age Beaker pottery.
03E0378:129	85.86 Vessel 6	[83](85)	Ceramic	Pottery	Body sherd of Late Neolithic/Early Bronze Age Beaker pottery.
03E0378:130	85.87 Vessel 6	[83](85)	Ceramic	Pottery	Body sherd of Late Neolithic/Early Bronze Age Beaker pottery.
03E0378:131	85.35 Vessel 8	[83](85)	Ceramic	Pottery	Rim sherd of Late Neolithic/Early Bronze Age Beaker pottery.
03E0378:132	85.66 Vessel 8	[83](85)	Ceramic	Pottery	Base-angle sherd of Late Neolithic/Early Bronze Age Beaker pottery.
03E0378:133	85.37 Vessel 8	[83](85)	Ceramic	Pottery	Neck sherd of Late Neolithic/Early Bronze Age Beaker pottery.
03E0378:134	85.67 Vessel 8	[83](85)	Ceramic	Pottery	Base-angle sherd of Late Neolithic/Early Bronze Age Beaker pottery.
03E0378:135	85.68 Vessel 8	[83](85)	Ceramic	Pottery	Base-angle sherd of Late Neolithic/Early Bronze Age Beaker pottery.
03E0378:136	85.69 Vessel 8	[83](85)	Ceramic	Pottery	Base-angle sherd of Late Neolithic/Early Bronze Age Beaker pottery.
03E0378:137	85.70 Vessel 8	[83](85)	Ceramic	Pottery	Base-angle sherd of Late Neolithic/Early Bronze Age Beaker pottery.
03E0378:138	85.71 Vessel 8	[83](85)	Ceramic	Pottery	Base-angle sherd of Late Neolithic/Early Bronze Age Beaker pottery.
03E0378:139	85.130	[83](85)	Ceramic	Pottery	Body sherd of Late Neolithic/Early Bronze Age Beaker pottery.
03E0378:140	85.131	[83](85)	Ceramic	Pottery	Body sherd of Late Neolithic/Early Bronze Age Beaker pottery.
03E0378:141	85.132	[83](85)	Ceramic	Pottery	Body sherd of Late Neolithic/Early Bronze Age Beaker pottery.
03E0378:142	85.133	[83](85)	Ceramic	Pottery	Body sherd of Late Neolithic/Early Bronze Age Beaker pottery.
03E0378:143	85.134	[83](85)	Ceramic	Pottery	Fragment of Late Neolithic/Early Bronze Age Beaker.
03E0378:144	85.135	[83](85)	Ceramic	Pottery	Fragment of Late Neolithic/Early Bronze Age Beaker.
03E0378:145	85.136	[83](85)	Ceramic	Pottery	Crumb of Late Neolithic/Early Bronze Age Beaker.
03E0378:146	85.137	[83](85)	Ceramic	Pottery	Crumb of Late Neolithic/Early Bronze Age Beaker.
03E0378:147	85.138	[83](85)	Ceramic	Pottery	Crumb of Late Neolithic/Early Bronze Age Beaker.

03E0378:148	85.139	[83](85)	Ceramic	Pottery	Crumb of Late Neolithic/Early Bronze Age Beaker.
03E0378:149	85.140	[83](85)	Ceramic	Pottery	Crumb of Late Neolithic/Early Bronze Age Beaker.
03E0378:150	85.19	[83](85)	Ceramic	Pottery	Neck sherd of Late Neolithic/Early Bronze Age Beaker pottery.
03E0378:151	85.95	[83](85)	Ceramic	Pottery	Body sherd of Late Neolithic/Early Bronze Age Beaker pottery.
03E0378:152	85.96	[83](85)	Ceramic	Pottery	Body sherd of Late Neolithic/Early Bronze Age Beaker pottery.
03E0378:153	85.97	[83](85)	Ceramic	Pottery	Body sherd of Late Neolithic/Early Bronze Age Beaker pottery.
03E0378:154	85.98	[83](85)	Ceramic	Pottery	Neck sherd of Late Neolithic/Early Bronze Age Beaker pottery.
03E0378:155	85.99	[83](85)	Ceramic	Pottery	Neck sherd of Late Neolithic/Early Bronze Age Beaker pottery.
03E0378:156	85.100	[83](85)	Ceramic	Pottery	Neck sherd of Late Neolithic/Early Bronze Age Beaker pottery.
03E0378:157	85.101	[83](85)	Ceramic	Pottery	Neck sherd of Late Neolithic/Early Bronze Age Beaker pottery.
03E0378:158	85.205	[83](85)	Ceramic	Pottery	Neck sherd of Late Neolithic/Early Bronze Age Beaker pottery.
03E0378:159	85.206	[83](85)	Ceramic	Pottery	Neck sherd of Late Neolithic/Early Bronze Age Beaker pottery.
03E0378:160	85/108.238	[83](85)	Clay	Burnt clay	
03E0378:161	85/108.236	[83](85)	Ceramic	Pottery	Fragment of Late Neolithic/Early Bronze Age Beaker.
03E0378:162	85.186	[83](85)	Ceramic	Pottery	Body sherd of Late Neolithic/Early Bronze Age Beaker pottery.
03E0378:163	85.103	[83](85)	Ceramic	Pottery	Fragment of Late Neolithic/Early Bronze Age Beaker.
03E0378:164	85.104	[83](85)	Ceramic	Pottery	Fragment of Late Neolithic/Early Bronze Age Beaker.
03E0378:165	85.105	[83](85)	Ceramic	Pottery	Fragment of Late Neolithic/Early Bronze Age Beaker.
03E0378:166	85.106	[83](85)	Ceramic	Pottery	Fragment of Late Neolithic/Early Bronze Age Beaker.
03E0378:167	85.107	[83](85)	Ceramic	Pottery	Fragment of Late Neolithic/Early Bronze Age Beaker.
03E0378:168	85.108-126	[83](85)	Ceramic	Pottery	Crumbs of Late Neolithic/Early Bronze Age Beaker.
03E0378:169	85.207-226	[83](85)	Ceramic	Pottery	Crumbs of Late Neolithic/Early Bronze Age Beaker.
03E0378:170	85.191-204	[83](85)	Ceramic	Pottery	Crumbs of Late Neolithic/Early Bronze Age Beaker.
03E0378:171	85.142-160	[83](85)	Ceramic	Pottery	Crumbs of Late Neolithic/Early Bronze Age Beaker.
03E0378:172	85.161-185	[83](85)	Ceramic	Pottery	Crumbs of Late Neolithic/Early Bronze Age Beaker.
03E0378:173	85/108.235	[83](85)	Clay	Burnt clay	Burnt clay.
03E0378:174	85.229-34	[83](85)	Ceramic	Pottery	Crumbs of Late Neolithic/Early Bronze Age Beaker.

03E0378:175	85.34 Vessel 8	[83](85)	Ceramic	Pottery	Rim sherd of Late Neolithic/Early Bronze Age Beaker pottery.
03E0378:176	85.52 Vessel 8	[83](85)	Ceramic	Pottery	Body sherd of Late Neolithic/Early Bronze Age Beaker pottery.
03E0378:177	85.63 Vessel 8	[83](85)	Ceramic	Pottery	Base sherd of Late Neolithic/Early Bronze Age Beaker pottery.
03E0378:178	85.64 Vessel 8	[83](85)	Ceramic	Pottery	Base sherd of Late Neolithic/Early Bronze Age Beaker pottery.
03E0378:179	85.65 Vessel 8	[83](85)	Ceramic	Pottery	Base sherd of Late Neolithic/Early Bronze Age Beaker pottery.
03E0378:180	85.51 Vessel 8	[83](85)	Ceramic	Pottery	Body sherd of Late Neolithic/Early Bronze Age Beaker pottery.
03E0378:181	85.38 Vessel 8	[83](85)	Ceramic	Pottery	Neck sherd of Late Neolithic/Early Bronze Age Beaker pottery.
03E0378:182	85.39 Vessel 8	[83](85)	Ceramic	Pottery	Neck sherd of Late Neolithic/Early Bronze Age Beaker pottery.
03E0378:183	85.40 Vessel 8	[83](85)	Ceramic	Pottery	Neck sherd of Late Neolithic/Early Bronze Age Beaker pottery.
03E0378:184	85.41 Vessel 8	[83](85)	Ceramic	Pottery	Neck sherd of Late Neolithic/Early Bronze Age Beaker pottery.
03E0378:185	85.42 Vessel 8	[83](85)	Ceramic	Pottery	Neck sherd of Late Neolithic/Early Bronze Age Beaker pottery.
03E0378:186	85.62 Vessel 8	[83](85)	Ceramic	Pottery	Neck sherd of Late Neolithic/Early Bronze Age Beaker pottery.
03E0378:187	85.127 Vessel 8	[83](85)	Ceramic	Pottery	Neck sherd of Late Neolithic/Early Bronze Age Beaker pottery.
03E0378:188	85.44 Vessel 8	[83](85)	Ceramic	Pottery	Body sherd of Late Neolithic/Early Bronze Age Beaker pottery.
03E0378:189	85.45 Vessel 8	[83](85)	Ceramic	Pottery	Body sherd of Late Neolithic/Early Bronze Age Beaker pottery.
03E0378:190	85.46 Vessel 8	[83](85)	Ceramic	Pottery	Body sherd of Late Neolithic/Early Bronze Age Beaker pottery.
03E0378:191	85.47 Vessel 8	[83](85)	Ceramic	Pottery	Body sherd of Late Neolithic/Early Bronze Age Beaker pottery.
03E0378:192	85.48 Vessel 8	[83](85)	Ceramic	Pottery	Body sherd of Late Neolithic/Early Bronze Age Beaker pottery.
03E0378:193	85.49 Vessel 8	[83](85)	Ceramic	Pottery	Body sherd of Late Neolithic/Early Bronze Age Beaker pottery.
03E0378:194	85.53 Vessel 8	[83](85)	Ceramic	Pottery	Body sherd of Late Neolithic/Early Bronze Age Beaker pottery.

03E0378:195	85.54 Vessel 8	[83](85)	Ceramic	Pottery	Body sherd of Late Neolithic/Early Bronze Age Beaker pottery.
03E0378:196	85.55 Vessel 8	[83](85)	Ceramic	Pottery	Body sherd of Late Neolithic/Early Bronze Age Beaker pottery.
03E0378:197	85.56 Vessel 8	[83](85)	Ceramic	Pottery	Body sherd of Late Neolithic/Early Bronze Age Beaker pottery.
03E0378:198	85.57 Vessel 8	[83](85)	Ceramic	Pottery	Body sherd of Late Neolithic/Early Bronze Age Beaker pottery.
03E0378:199	85.58 Vessel 8	[83](85)	Ceramic	Pottery	Body sherd of Late Neolithic/Early Bronze Age Beaker pottery.
03E0378:200	85.59 Vessel 8	[83](85)	Ceramic	Pottery	Body sherd of Late Neolithic/Early Bronze Age Beaker pottery.
03E0378:201	85.60 Vessel 8	[83](85)	Ceramic	Pottery	Body sherd of Late Neolithic/Early Bronze Age Beaker pottery.
03E0378:202	85.61 Vessel 8	[83](85)	Ceramic	Pottery	Body sherd of Late Neolithic/Early Bronze Age Beaker pottery.
03E0378:203	85.72 Vessel 8	[83](85)	Ceramic	Pottery	Body sherd of Late Neolithic/Early Bronze Age Beaker pottery.
03E0378:204	85.128 Vessel 8	[83](85)	Ceramic	Pottery	Body sherd of Late Neolithic/Early Bronze Age Beaker pottery.
03E0378:205	85.129, Vessel 8	[83](85)	Ceramic	Pottery	Body sherd of Late Neolithic/Early Bronze Age Beaker pottery.
03E0378:206	85.4, Vessel 1	[83](85)	Ceramic	Pottery	Body sherd of Late Neolithic/Early Bronze Age Beaker pottery.
03E0378:207	85.5, Vessel 1	[83](85)	Ceramic	Pottery	Body sherd of Late Neolithic/Early Bronze Age Beaker pottery.
03E0378:208	N/A	[83](85)	Flint	Debitage	Flint flake debitage.
03E0378:209	N/A	[83](85)	Flint	Debitage	Flint flake debitage.
03E0378:210	N/A	[83](85)	Flint	Debitage	Flint flake debitage.
03E0378:211	85.90	[83](85)	Ceramic	Pottery	Body sherd of Late Neolithic/Early Bronze Age Beaker pottery.
03E0378:212	85.94	[83](85)	Ceramic	Pottery	Body sherd of Late Neolithic/Early Bronze Age Beaker pottery.
03E0378:213	85.213	[83](85)	Ceramic	Pottery	Necksherd of Early Neolithic Carinated bowl pottery.
03E0378:214	85.1	[83](85)	Ceramic	Pottery	Base-anglesherd of Chalcolithic Beaker pottery.
03E0378:215	85.2	[83](85)	Ceramic	Pottery	Base-anglesherd of Chalcolithic Beaker pottery.
03E0378:216	85.3	[83](85)	Ceramic	Pottery	Body sherd of Chalcolithic Beaker pottery.
03E0378:217	85.4	[83](85)	Ceramic	Pottery	Body sherd of Chalcolithic Beaker pottery.
03E0378:218	85.5	[83](85)	Ceramic	Pottery	Neck sherd of Chalcolithic Beaker pottery.

03E0378:219	85.6	[83](85)	Ceramic	Pottery	Body sherd of Chalcolithic Beaker pottery.
03E0378:220	85.7	[83](85)	Ceramic	Pottery	Body sherd of Chalcolithic Beaker pottery.
03E0378:221	85.8	[83](85)	Ceramic	Pottery	Body sherd of Chalcolithic Beaker pottery.
03E0378:222	85.9	[83](85)	Ceramic	Pottery	Body sherd of Chalcolithic Beaker pottery.
03E0378:223	85.10	[83](85)	Ceramic	Pottery	Body sherd of Chalcolithic Beaker pottery.
03E0378:224	85.11	[83](85)	Ceramic	Pottery	Body sherd of Chalcolithic Beaker pottery.
03E0378:225	85.12	[83](85)	Ceramic	Pottery	Body sherd of Chalcolithic Beaker pottery.
03E0378:226–03E0378:302	N/A	[83](85)	Clay	Objects	76 small, shapeless, pieces of fired clay, weighing 48g

Appendix 3 Drawing Register

Sheet No.	Scale	Description
1	1:20	Post-excavation plan of pits [83] & [86]
2	1:20	Post-excavation plan of pits [83] & [86] (inked version)
3	1:10	North east facing section of [34]
3	1:10	North west facing section of [40]
3	1:10	West facing section of [43]
3	1:10	South east facing section of [48]
3	1:10	West facing section of [04]
3	1:10	East facing section of [16]
3	1:10	North facing section of [21]
3	1:10	East facing section of [06]
4	1:10	North west facing section of [89], [92] & [95]
4	1:10	West facing section of [50]
4	1:10	East facing section of [83]
4	1:10	South facing section of [102]
4	1:10	East facing profile of [125]
4	1:10	North east facing section of [55]
4	1:10	South facing section of [09]
4	1:10	South facing section of [68]
4	1:10	South facing section of [110]
4	1:10	East facing section of [08]
4	1:10	South facing section of [65]
4	1:10	North facing section of [120]
5	1:10	North facing section of [71]
5	1:10	North facing section of [86]
5	1:10	South to north profile of feature
5	1:10	West facing section of [86]
5	1:10	North facing section of [122]
5	1:10	East facing section of [110]
5	1:10	South facing section of [124]
5	1:10	North west facing section of [130]
5	1:10	South facing section of [58]
5	1:10	South facing section of [62]
5	1:10	North facing section of [19]
5	1:10	North facing section of [39]
5	1:10	North west facing section of [45]
5	1:10	South facing section of [53] & [54]
5	1:20	South facing section of [01], [02], [59] & bank (22)
5	1:10	Section of [69]
5	1:10	East facing section of [79]
5	1:10	North facing section of [81]
5	1:10	West facing section of [112]
5	1:10	South east facing section of [115]

Appendix 4 Sample Register

Sample No.	Context No.	Description
1	-	
2	-	
3	(10), [09]	Soil & charcoal
4	(11), [09]	Soil & charcoal
5	-	
6	(18), [19]	Soil & charcoal
7	-	
8	(38), [39]	Soil & charcoal
9–14	-	
15	(51), [53]	Soil & charcoal
16–20	-	
21	(63), [65]	Soil & charcoal
22	(64), [65]	Soil & charcoal
23–25	-	
26	(74), [71]	Soil & charcoal
27	(73), [71]	Soil & charcoal
28	-	
29	(72), [71]	Soil & charcoal
30–36	-	
37	(94), [95]	Soil & charcoal
38	-	
39	(87), [86]	Soil & charcoal
40–46	-	
47	(121), [110]	Soil & charcoal
48–65	-	
66	(87), [86]	Soil & charcoal
67	(99), [86]	Soil & charcoal
68	(84), [83]	Soil & charcoal
69	(84), [83]	Soil & charcoal
70–88	-	
89[2]	(85), [83]	Soil & charcoal
561	(84), [83]	Soil & charcoal
562	(84), [83]	Soil & charcoal

Appendix 4 Photography Register

There were 102 digital images recorded and these have been retained in the archives.

[2] No sample numbers were issued between No. 90–560.

Appendix 6 Environmental Report

Scheme – N8 Cashel Bypass & N74 Link Road

Site Name- Site 13 Monadreela

Excavation number – 03E0378

County – Tipperary

Job code – ENV/083

Author- Susan Lyons

Date – 16/07/10[3]

Plant Macrofossil Remains & Charcoal Report

[3] This specialist report was written in 2010. It was subsequently updated by the NRA Project Archaeologist in 2013 to incorporate data from C14 dates on the Project. A copy of the original report has been retained in the N8 Cashel Bypass site archives.

Contents

1 INTRODUCTION

This report discusses the plant macrofossil remains and charcoal remains recorded from the soil samples associated with the archaeological excavations at Site 13 Monadreela (03E0378). While the carbonized plant remains and the charcoal are both constituted as environmental remains, they represent the results of two separate human activities. The remains of charred/waterlogged cereal remains and wild taxa can suggest evidence for arable farming and the selection of crops and plants brought to the site. The wood charcoal material on the other hand is characteristic of the wood species selected as a fuel resource and can go some way to understanding the local woodland environment.

The primary objective of the plant remains and charcoal project is to identify, analyse and interpret the botanical remains present in order a) highlighting the function of certain areas of the site or indeed the features recorded within and b) to help with understanding the change in the floral environment and activities at the site over time.

For the purpose of this report, Part A will focus on the plant remains analysis while Part B will discuss the wood and charcoal identifications. They will later form part of an overall interpretation of environmental remains for the site in the concluding remarks. This report will later form part of an overall scheme-wide synthesis of environmental archaeological remains from the excavations along the N8 Cashel Bypass and N74 Link Road (Lyons, *forthcoming)*.

2 BACKGROUND

Twenty flot samples were analysed from excavations associated with medieval activity recorded at Site 13 Monadreela, Co. Tipperary. Site 13 was excavated as part of the archaeological mitigation programme associated with the N8 Cashel Bypass and the N74 Link Road under archaeological excavation licence number 03E0378.

The site contained a number of pits and postholes, along with post-medieval furrows and ditches. The on-site retrieval of Bronze Age pottery and a polished stone axe is indicative of prehistoric activity. Six radiocarbon dates were obtained for the site:

Context No.	Sample No.	Material type	C14 date (2 sigma Cal)
(94), [95]	37	Alder charcoal	2484–2236 cal. BC (UBA-13736)
(87), [86]	39	Ash charcoal	2467–2236 cal. BC (UBA-13737)
(85), [83]	89	Hazel charcoal	2457–2204 cal. BC (UBA-13903)
(99), [86]	67	Alder charcoal	2334–2140 cal. BC (UBA-13902)
(11), [09]	3	Hazel charcoal	1299–1059 cal. BC (UBA-13734)
(72), [71]	29	Cherry-type charcoal	806–598 cal. BC (UBA-13735)

3 PART A: PLANT REMAINS IDENTIFICATION AND ANALYSIS

3.1 Methodology

All samples were [4]processed by Eachtra Archaeological Projects Ltd (Eachtra Archaeological Projects Ltd, 2009).

3.1.1 Sample processing (after Eachtra Archaeological Projects Ltd)

The processing technique employed for bulk dry soil samples is one of floatation. This is where each sample is soaked in water and agitated by hand to loosen any charred remains from the soil particles which allows for this material to be separated and float to the surface. This floating material (flot) is poured off and trapped in a sieve (mesh size 250 µm) and, once dried, scanned for plant remains using a binocular microscope. The larger residual material left behind (retent) is washed through a 1mm, 2mm and 5mm mesh or sieve and air-dried. Once dry, each retent is sorted by eye and any material of archaeological significance removed.

3.1.2 Quantification and identification of plant remains

The flot samples are viewed under a low powered binocular microscope (magnification x0.8 to x5). Where preservation allowed, all charred remains recovered were identified to species level where applicable and the constituents quantified numerically. Those plant remains which were abraded or fragmented

[4] Soil samples are processed according to the standards and guidelines outlined in the Institute of Archaeologists of Ireland (IAI) 'Environmental Sampling Guidelines for Archaeologists', (IAI, 2006) and *Palaeoethnobotany: Handbook of Procedures*. 2nd edition, San Diego: Academic Press (Pearsall, D 2000)

were recorded using an abundance key to highlight the concentrations of material identified from each sample:

+ = rare (1-10), ++ = occasional (11-50), +++ = common (51-100) and ++++ = abundant (>100)

Plant species are made using reference to the author's seed collection and standard seed atlases and references; *Flora of the British Isles* (Clapham, A R, Tutin, T G, Warburg, E F, 1957), *Zadenatlas der Nederlandsche Flora* (Beijerinck, W.1976), *New Flora of the British Isles 2nd Edition* (Stace, C, 1997) and *Digital Seed Atlas of the Netherlands* (Cappers, R.T.J., R.M. Bekker and J.E.A. Jans, 2006).

3.2 Results

The plant remains recorded from Site 13 are presented in **Table 1**.[5]

Carbonized cereal remains – Carbonized cereal grains were recorded in small quantities and confined to Early Bronze Age pits **83 (85)** and **86 (99)** and Late Bronze Age pit **09 (10** and **11)**. Barley (*Hordeum* sp.) was the most common crop species recorded from all three features, with emmer wheat (*Triticum diococcum*) and oat *(Avena* sp.) identified from **99**.

Carbonized cereal grains which were badly abraded appear in the table as indeterminate cereal grain (cereal indet.). These grains are difficult to identify to species level and can become vesicular and eroded as a result of charring at high temperatures, the burning of damp grain or that this material had degraded due to re-deposition and/or exposure.

A small concentration of cereal chaff in the form of oat palae/lemma fragments were also recorded from Late Bronze Age pit **99**. The majority of grains however were free of other chaff components [spikelets and glume bases] which are required in identifying between species and therefore definitive identifications were difficult to undertake.

Just one fragment of carbonized oat chaff (palea/lemma) was recorded from **99**. It is difficult to fully interpret this material in the absence of a larger chaff assemblage and is likely to just be attached to oat grains during the drying process.

Carbonized wild taxa– Carbonized crab apple (*Malus sylvestris)* pips were recorded from Early Bronze Age pit **83 (85)**.

[5] The original context number using 'C130' before each appears in all tables but for clarity has not been retained in this text.

Carbonized nutshell - Carbonized nutshell was recorded from Early Bronze Age pits **83 (84)** and **(85)** and **86 (87)**, Early Iron Age hearth/pit **71 (73)** and undated posthole **53 (51)**. Based on the curvature and striation marks on the shell, it is tentatively identified as hazelnut (*Corylus avellana)* shell.

Charcoal – Fragmented charcoal was recovered in low to high concentrations from all features. The results of the charcoal identifications are presented and discussed in Part B of this report.

3.3 Discussion

3.3.1 Carbonization of plant remains

Charred plant remains are those which have been heated to more than about 200° C, but where there is not enough oxygen to complete the burning process. Instead, the organic components are converted to a more carbon-rich resilient material or to carbon itself rather than to ash (Broadman & Jones, 1990).

Carbonized cereal remains recorded from archaeological sites are interpreted as the residual remains or charred debris from crop drying events. Some remains are found in the same place that they were charred (hearths, fires, kilns, ovens, burnt stores). More are found thinly spread and scattered across a wider area entering deposits such as occupational layers, pits and potholes for example. Over time, this material can move and be re-distributed due to disturbances such as soil movement, extreme climatic conditions, root penetration or worm/animal action.

The carbonization process obviously affects different species and plant components in different ways, where finer, lighter material can be destroyed more easily than larger elements. It most therefore be noted that the charred plant remains recovered from archaeological features can as much reflect the results of the carbonization process as how and what plant remains were used on a site.

3.3.2 The carbonized plant remains from Site 13, Monadreela

The presence of carbonized cereal grains from Early Bronze Age pits **83 (85)** and **86 (99)** and Late Bronze Age pit **09 (10** and **11),** represents the remains of agricultural activity in the form of small scale corn drying, which denotes that some degree of crop processing was being undertaken at the site.

The presence of emmer wheat and barley would not be unusual from a prehistoric site, since both crops have been cultivated from the prehistoric period in Ireland

(Monk, 1986, 37). While cultivated oat is generally a medieval crop type (Monk, 1986), it has been recorded from prehistoric levels, as the evidence from the Neolithic site at Balbridie in Scotland (Fairweather & Ralston, 1993) showed where a single oat grain yielded a date of 4820 +/-80 BP (Monk, 2000). In Ireland oat has been recorded from prehistoric deposits at Knowth, Co. Meath (Collins, 1997), Granny, Co. Kilkenny (Lyons, 2005), and Monanny, Co. Monaghan (Lyons, 2005) as well as Middle Bronze Age domestic and funerary sites recorded along the Gas Pipeline to the West corridor (Johnston, 2007, 72).

Despite its presence on prehistoric sites, no oat grain from an Irish site has yet returned a Neolithic or Bronze Age date. It has been surmised that the oat grains recovered from a prehistoric context are either intrusive components of a later date or that of wild oat (*Avena fatua*), a common field weed, which may have grown among other crops at the time (Godwin, 1975, 404; Fairweather & Ralston, 1993).

The presence of oat at Site 13, Monadreela therefore is difficult to explain in such prehistoric contexts and may be associated with redeposition from later post-medieval activity that was also recorded at the site.

The fragments of charred crab apple (*Malus* cf sylvestris) pips were also recorded from (**85**). Since no Maloideae spp. (pomaceous woods) were recorded from this context, it is possible that this material represents the remains of gathered food rather than attached to branches used as fuel. Whether this material was deliberately deposited or not however is difficult to fully ascertain. Charred apple seeds and endocarps have also been identified from other prehistoric sites, such as the Neolithic deposits at Tankardstown, Co. Limerick (Monk, 1988, 185) and Gortore, Co. Cork (Kiely, 2006,) and a Bronze Age hearth at Killadreenan, Co. Wicklow (Halwas, 2009, 266; Johnson, 2005).

Carbonised hazelnut shell, which was recorded from many of the samples at Site 13, is also a frequent occurrence on archaeological sites (Moffett *et al,* 1989; Greig, 1991) and its presence is usually interpreted as:

- the waste debris of gathered foodstuffs that have been discarded onto fires
- the remnants of drying or parching hazelnuts near or over a fire.
- material collected with hazel wood for fuel or kindling

It can be argued that the prehistoric diet was a complimentary one, where cereals provided necessary carbohydrates, some vitamins and minerals while gathered foods such as hazelnuts and fruits are high in protein, fats, and other vitamins (Vitamin E) and minerals

(Monk 2000). Hazelnuts and crab apple would have been readily available in the local woodland and hedgerows and would have played a significant part in a prehistoric diet.

4 PART B: CHARCOAL IDENTIFICATION AND ANALYSIS

4.1 Methodology

4.1.1 Quantification of charcoal remains

Quantifying charcoal samples can be difficult as many wood species can be affected by heat in different ways and hence become fragmented into an arbitrary number of fragments. Due to the potential for a very high number of charcoal fragments from the samples, a representative sample of 50 charcoal fragments (Keepax, 1988) are randomly chosen from larger samples for identification and analysis. In the case of smaller samples all charcoal fragments within are identified. The charcoal fragments of each species identified are counted, weighted (grams) and bagged according to species.

4.1.2 Identification of charcoal remains

Wood charcoal identifications were undertaken in accordance with Section 25 of the National Monuments Act, 1930, as amended by Section 20 of the National Monuments Amendment Act 1994, to alter an archaeological object.

The flot remains for were sieved through a bank of sieves (2mm, 1mm and 0.5mm) to separate the larger charcoal samples from the much smaller charcoal fibres, which would prove more difficult to identify.

The larger sized charcoal fragments (>3mm in width) were fractured to view the three planes [transverse, radial and tangential sections] necessary for microscopic wood identification. The wood species identifications were conducted under a binocular microscope using incident light and viewed at magnifications of 100x, 200x and 400x where applicable. Where applicable the number of growth rings and the curvature of the rings are also noted, which can help with determining if the material is from trunk wood or smaller branches/twigs.

Wood species identifications are made using wood reference slides and wood keys devised by Franklin and Brazier (1961), Schweingruber (1978), Hather (2000) and the International Association of Wood Anatomists (IAWA) wood identification manuals and (www.lib.ncsu/edu/insidewood) by Wheeler, Bass and Gasson (1989).

4.2 Results

The results of the charcoal identifications are presented in **Table 2.**

Six species totalling 540 identifications were recorded from the charcoal samples associated with Site 13, Monadreela. The assemblage was dominated by oak (*Quercus* sp.), hazel (*Corylus avellana*) and ash (*Fraxinus excelsior*), followed by lower incidences of alder (*Alnus glutinous),* cherry-type (*Prunus* sp.) and pomaceous woods (Maloideae/Pomoideae spp.) **Fig 1.**

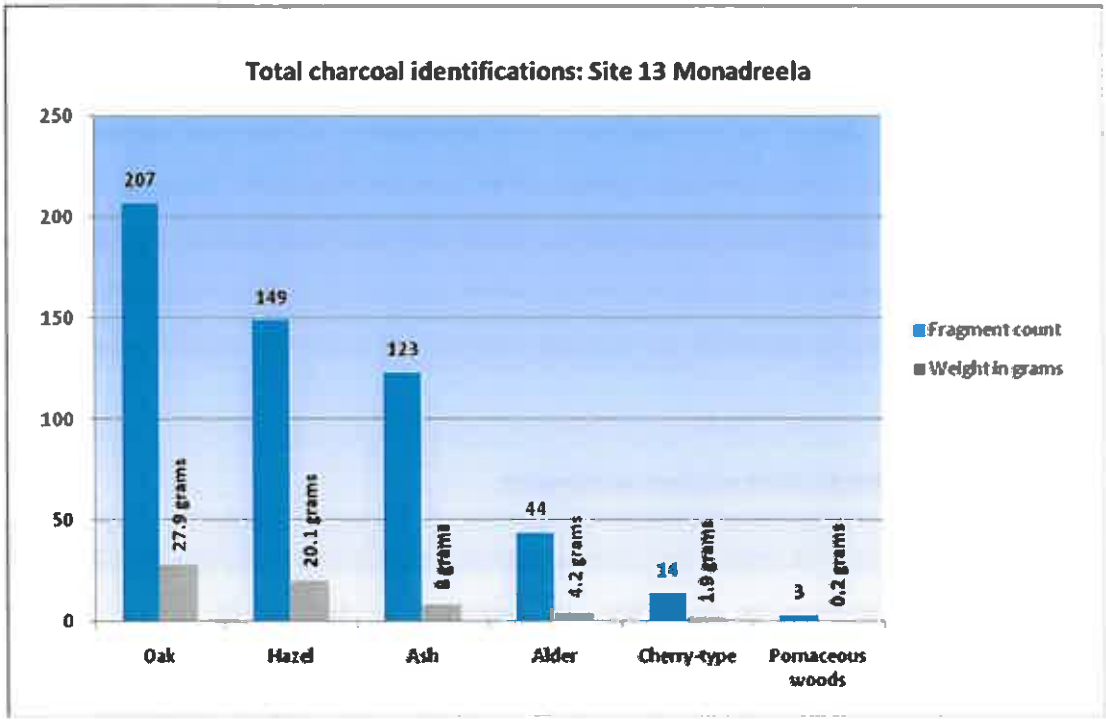

Fig. 1

4.3 Discussion

4.3.1 Background and origin of wood species

***Quercus* sp. (oak)**

Oak is a tall deciduous woodland tree, often growing in association with hazel and ash. Most species prefer damp, non-calcareous soils on lowland or montane sites. Of the 27 European species, pedunculate oak (*Quercus robur)* and sessile oak (*Quercus petraea)* are native to Ireland. Pedunculate oak is common on heavy clay lowland soils whereas sessile oak thrives on the lighter loams characteristic of higher ground (Culter & Gale, 2000). The wood is easy to cleave both radially and tangentially and has provided one of the most important building materials since the prehistoric period (Culter and Gale, 2000). The heartwood timber is renowned for its durability but the paler sapwood is susceptible to beetle and fungal attack. The strength of the timber depends on the species and is influenced by climatic and edaphic factors (Edlin, 1951). When burnt, oak charcoal, particularly the dense heartwood, has higher calorific values than most European woods and this can make for good long-lasting fuel (Culter & Gale, 2000).

***Corylus avellana* (hazel)**

Hazel woodlands replaced birch in the early post-glacial forests and remains on some shallow limestone soils to the present day (Pilcher & Hall, 2001). The species can tolerate most soil types, but not waterlogged conditions and forms a small deciduous tree or shrub. It commonly occurs in understorey of oak and/or ash woodlands, where it may grow to a height of 10m or more. In open areas or woodland glades hazel grows as a shrub. Hazel is a common species recorded from Irish archaeological sites and its widespread presence is highlighted in pollen diagrams from the Neolithic to the medieval period (Caseldine, 1996). It produces good firewood and is a suitable wood for kindling. The wood is soft enough to be split yet flexible and strong enough to be used in rope making and basketry. It has also proved a useful resource in the construction of hurdles, wattling, palisades and trackways from prehistoric times (Pilcher & Hall, 2001).

***Fraxinus excelsior* (ash)**

Ash thrives well on nutrient-rich soils but is also a common woodland species and grows in mixed woodland with oak on damp, slightly acidic soils (Culter and Gale, 2000). Pollen analysis indicates that ash became more common in the pollen record from the Neolithic period onwards (Mitchell, 1953/4). This could be as a result of more clearance due to agricultural practices at the time, where ash was able to germinate and grow more vigorously as secondary woodland and in marginal areas and hedges (Kelly, 1976).

***Alnus glutinous* L. Gärtner (alder or black alder)**

Alder is usually found growing close to running water, rivers or in damp woodland, in the latter often with oak (Orme and Coles, 1985; Rackham, 1995). In marshland alder grows as a shrub frequently mixed with willow and alder buckthorn to form alder carr (Cutler and Gale, 2000). It can also grow well in and on fen peat. Germination and early growth of alders requires a constant supply of water, however once the tree reaches maturity its root system makes the tree less dependent on high water levels (Stuijts, 2005). Alders commonly produce root nodules which contain nitrogen-fixing bacteria, known as *Schinzia alni* which enables alder to enrich soils through its fallen leaves hence allowing the tree to survive in poorer soil conditions (Milner cited in Culter and Gale, 2000; van der Meiden cited in Stuijts, 2005). In suitable conditions alder growth is fast, usually reaching a height of 25m with a maximum girth of 1m and can grow to an age of sixty to one hundred years (Strotelder cited in Stuijts, 2005). While alder makes for poor fuel, it produces good quality charcoal (Edlin, 1951). The wood can quickly turn a reddish colour after cutting and once dry it is water resistant and does not split easily. Once in a waterlogged state, alder is very durable and is often used in the construction of underwater bridge piles, houses and scaffolding (Culter and Gale, 2000). Alder is traditionally used in the making of smaller objects such as bowls, handles and broomsticks and its bark can be used in the tanning of leather (Rackham, 1980).

***Prunus sp.* (cherry-type)**

The cherry species can be difficult to distinguish in the absence of bark, buds and leaves. Wild cherry (*P. avium)* is a medium to tall tree, common to woodlands and

hedges on light, well-drained soils. It produces inferior firewood. The timber is a red colour and although tough and hard is unsuitable for outdoor use as it decayed easily (Culter and Gale, 2000). Bird cherry (*P. padus)* is a smaller tree and less common than wild cherry. It grows in marginal woodland as a solitary tree and can live for up to eighty years (Rackham, 1980). The wood has no real economical value, although has been used in barrel production (Culter and Gale, 2000). Both species are used in the production of ornamental or culinary objects (Culter and Gale, 2000). Blackthorn (*Prunus spinosa* L.) is a spiny shrub often found in woodlands where the canopy has been opened up and is quick to colonise clearings and rapidly forms dense thickets, particularly in coastal regions. It is also found near streams, growing close to alder (Orme and Coles, 1985). This species does not usually live beyond forty years and produces new shoots from their roots. When fully matured, its sharp thorns act as a barrier shielding younger trees from grazing animals (Hickie, 2004).

***Maloideae/Pomoideae* spp. (pomaceous woods)**

The pomaceous wood species includes the genera *Malus* (apple), *Pyrus* (pear), *Sorbus* (rowan/mountain ash or whitebeam) and *Crataegus* (hawthorn). They are anatomically very similar and in the absence of bark, buds and leaves cannot be differentiated between each other very often. The pomaceous wood types are small deciduous spiny trees or shrubs and are common to the scrub margins of woodlands and hedgerows (Culter and Gale, 2000). The apple species, often crab apple (*Malus sylvertris*) in woodlands, is a light-demanding tree and is often found in open oak woods. When dry, crab apple makes for good firewood. Rowan or mountain ash (*Sorbus* sp.) is a hard, smooth wood which can be split and worked with ease. The wood from all members of the Pomoideae is hard with a close, compact grain, ideal for carving and engraving.

4.3.2 Distribution of charcoal remains from Site 13, Monadreela (Fig. 2)

Charcoal is a common result of firing events associated with occupational, domestic and ritual activity on archaeological sites and usually reflects a) the use of hearths and pyres in and around the site and/or b) cleaning out and dumping of this burnt debris into nearby open features. The charcoal identified at Site 13 represents some of the wood species selected to use as fuel at the site and this can help to understand what species potentially grew in the area.

Oak, hazel and ash were the most prominent species recorded from pits and posthole deposits at Site 13. This suggests that they were most likely growing in plenty supply in the local woodland and collected for both fuel and building material. Ash dominates the charcoal assemblage from posthole deposits at the site, followed by oak and hazel. Oak and ash are both durable woods which would have been suitable to large scale construction works, while hazel was used in wattling and in the construction of internal divisions/walls (Culter and Gale, 2000). Charcoal from structural deposits, such as postholes, may reflect the remains of a burnt structure or part of a burnt post. Charcoal is often recorded from postholes and while is it difficult to ascertain if it represents a structure that had burnt down, it is also interpreted as the result of construction methods, such as a) the charring of post bases to prevent the timbers from rotting b) a way of re-sizing posts of c) the method by which the timbers were felled.

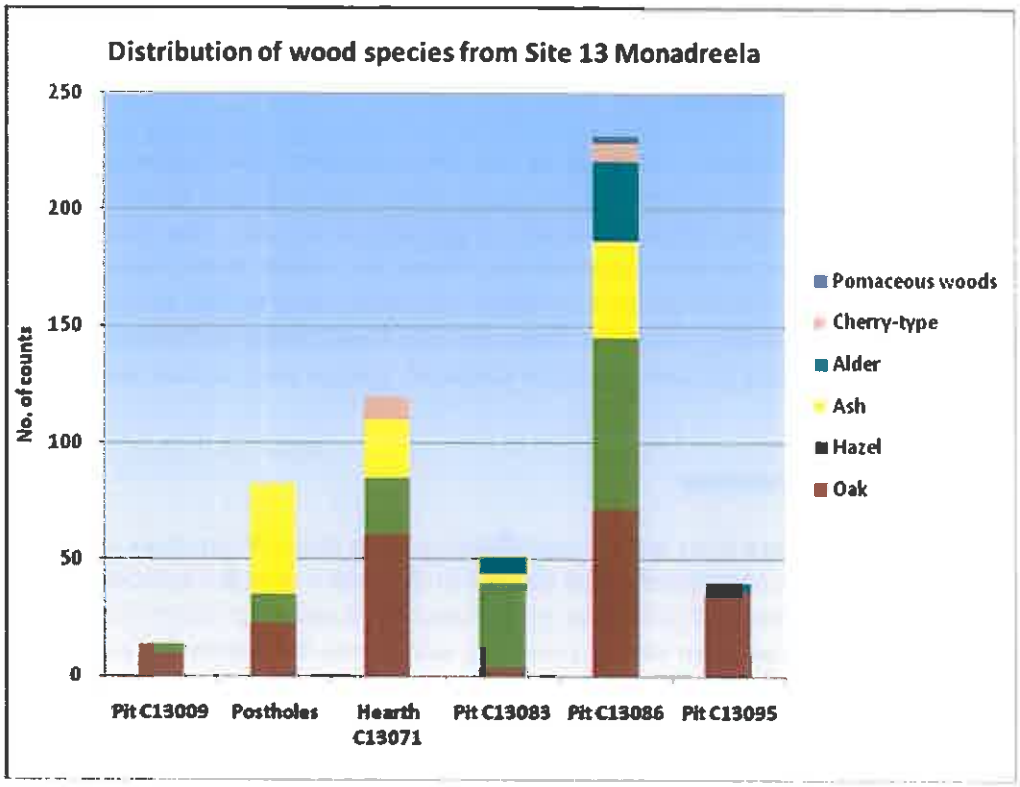

Fig. 2

Based on the composition and distribution of oak, hazel and ash from Early Bronze Age **83 and 86**, Late Bronze Age pit **09**, and undated pit **95** it is likely that these features contained charred debris from contemporary firing activities. Early Iron Age hearth/pit **71** contained exclusively oak from its' middle fill **(73)** and ash from upper fill **(74)**, which may reflect single dumping episodes or the remains of fuel debris from a specialized activity, since both species were considered important woods during the prehistoric period. The presence of a mix of hazel, oak and cherry-type from basal fill **(72)** could be indicative of wood used as starter fuel or tinder.

Other species, such as alder, cherry-type and pomaceous woods were also present at the site and likely to have supplemented the local fuel stock. The charcoal assemblage recorded may also represent redeposited charred debris which were dumped into these features periodically from other sources.

While the charcoal identified represents the wood types that was burnt accidentally or as fuel at the site, it is also likely to reflect some of the flora that grew in the nearby hedges, scrub and woodland. The presence of ash, hazel and oak, which are typical woodland species that grow in close proximity to each other, indicate that the site was located close to relatively dense woodland. Cherry-type and pomaceous woods are common to marginal woodland and clearances, while alder indicates that a river or waterlogged areas were also close-by.

Once again based on a small charcoal assemblage it is difficult to distinguish whether the wood species identified were chosen purposely for specific actions or if they are the result of a random selection process. Despite this these woods all provide good quality charcoal and have properties suitable for construction works, all of which would have been useful resources at the site.

5 Conclusions

The analysis of the plant remains and wood charcoal from Site 13, Monadreela provided the opportunity to highlight and interpret the archaeobotanical material recorded at the site.

The plant remains recorded at the site represents both cultivated and gathered foodstuffs. The presence of oat could reflect later intrusive material, which entered prehistoric deposits as a result of agricultural activity. The charcoal assemblage recorded at the site contained oak, hazel, ash, alder, cherry-type and pomaceous woods. All species would have been commonly used as fuel and probably collected from the nearby woodland. Oak, ash and hazel clearly dominates the assemblage and are likely to have been the favoured species used as fuel and in construction works.

6 Recommendations

1. There is no further identification work required on these samples from Site 13, Monadreela. Any additional processed samples associated with features excavated at the site should also be scanned to determine if there are any other plant remains present, which may help with the interpretations put forward.
2. All flot samples associated with Site 13, Monadreela should be retained permanently in accordance with the National Monuments Act 1930 (Section 2) and the National Monuments Act 1994 (Section 9) and for future archaeobotanical research studies to be carried out.
3. A record of the methodology and results of this analysis should be included in any final report

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Table 1. Composition of plant remains from Site 13, Monadreela (03E0378)

Feature		Pit		Postholes					Hearth/Pit			Pits									
Cut number		09		19	39	53		65		71		83						86		95	110
Fill number		10	11	18	38	51	63	64	72	73	74	85	84	84	84	84	87	87	99	94	121
Sample number		3	4	6	8	15	21	22	29	27	26	89	68	69	561	562	39	66	67	37	47
Carbonized plant remains																					
Triticum dioccocum	emmer wheat																		2		
Hordeum sp.	barley	5	6									4							3		
Avena sp.	oat																		5		
Cereal indet	indeterminate		+																		
Malus cf slyvestris	crab apple											33									
Carbonized cereal chaff																					
Avena sp.	oat																		+		
Cereal indet	indeterminate																				
Other carbonized material																					
Charcoal		++	+		+	+++	++	++		++++		++++			++	+++		+++	++++	++++	+
Hazelnut shell						+				+		++			++++	+		++			

Key: + = rare (1-10), ++ = occasional (11-50), +++ = common (51-100) and ++++ = abundant (>100)

Table 2. Charcoal Identifications from Site 13, Monadreela (03E0378)

Context number	Sample number	Flot volume (grams)	Context description	Wood Species Identifications	No. of fragments	Charcoal weights (grams)	Size of fragments (mm)	No. of growth rings	Comments
10	4	2.2 grams	Basal fill of pit 09	Quercus sp. (oak)	10	0.3 grams	3mm-8mm	2-3	
11	3	2.5 grams	Primary fill of pit 09	Corylus avellana (hazel)	4	0.3 grams	3mm-5mm	<3	
18	6	0.5 grams	Basal fill of posthole 19	Fraxinus excelsior (ash)	3	0.3 grams	4mm	<3	
38	8	0.7 grams	Basal fill of posthole 39	Fraxinus excelsior (ash)	7	0.3 grams	3mm-4mm	<3	
51	15	6.6 grams	Single fill of posthole 53	Fraxinus excelsior (ash)	38	2.1 grams	4mm-20mm	3-8	
				Corylus avellana (hazel)	7	0.8 grams	3mm-8mm		
				Quercus sp. (oak)	5	1.2 grams	3mm-12mm	2-5	
63	21	5.8 grams	Primary fill of posthole C65	Quercus sp. (oak)	11	0.7 grams	3mm-10mm	2-4	
64	22	3.8 grams	Basal fill of posthole 65	Quercus sp. (oak)	7	0.3 grams	3mm-5mm	<3	
73	27	15.3 grams	Primary fill of hearth/pit 71	Quercus sp. (oak)	50	5.9 grams	4mm-30mm	3-11	
72	29	3.4 grams	Basal fill of hearth/pit 71	Corylus avellana (hazel)	24	1.5 grams	3mm-12mm	3-8	

				Quercus sp. (oak)	11	0.6 grams	3mm-9mm	2-4	
				Prunus sp. (cherry-type)	10	0.5 grams	4mm-8mm	2-4	
74	26	8.7 grams	Upper fill of hearth/pit 71	Fraxinus excelsior (ash)	25	2.5 grams	4mm-20mm	3-8	
84	68	8 grams	Upper fill of pit 83	Alnus glutinous (alder)	14	1 gram	3mm-10mm	2-6	
				Quercus sp. (oak)	11	3.4 grams	4mm-15mm	3-8	
				Prunus sp. (cherry-type)	4	0.7 grams	3mm-5mm	<3	
				Fraxinus excelsior (ash)	2	0.2 grams	3mm	<3	
84	69	9 grams	Upper fill of pit 83	Corylus avellana (hazel)	36	2.4 grams	4mm-20mm	3-11	
				Fraxinus excelsior (ash)	6	0.4 grams	3mm-5mm	<3	
				Alnus glutinous (alder)	5	0.4 grams	3mm	<3	
				Maloideae spp. (pomaceous woods)	3	0.2 grams	4mm	<3	
84	561	11.2 grams	Upper fill of pit 83	Quercus sp. (oak)	11	3.4 grams	3mm-30mm	3-9	
				Prunus sp. (cherry-type)	4	0.7 grams	3mm-7mm	<3	
				Corylus avellana (hazel)	3	0.5 grams	3mm-6mm	<3	
				Fraxinus excelsior (ash)	2	0.2 grams	3mm-8mm	<3	
84	562	3 grams	Upper fill of pit 83	Alnus glutinous (alder)	14	1 grams	4mm-10mm	3-6	
				Quercus sp. (oak)	6	0.6 grams	4mm-6mm	2-4	

				Fraxinus excelsior (ash)	6	0.7 grams	<5mm		
85	89	11.4 grams	Basal fill of pit 83	Corylus avellana (hazel)	36	6.3 grams	3mm-35mm	3-11	
				Alnus glutinous (alder)	7	1.4 grams	3mm-10mm	3-6	
				Quercus sp. (oak)	4	0.5 grams	4mm-10mm	<3	
				Fraxinus excelsior (ash)	4	0.6 grams	<5mm	<3	
87	39	14.7 grams	Upper fill of pit 86	Corylus avellana (hazel)	20	5.6 grams	4mm-25mm	3-10	
				Quercus sp. (oak)	15	3.4 grams	3mm-35mm	3-7	
				Fraxinus excelsior (ash)	14	2.4 grams	3mm-25mm	2-8	
				Alnus glutinous (alder)	1	0.1 grams	<5mm	<3	
99	67	1.9 grams	Basal fill of pit 86	Quercus sp. (oak)	5	0.3 grams	3mm-5mm	<3	
87/99	66	10.2 grams	Mixed fills of pit 86	Quercus sp. (oak)	24	4 grams	3mm-20mm	3-6	
				Corylus avellana (hazel)	14	2.5 grams	3mm-25mm	3-7	
				Fraxinus excelsior (ash)	12	1.4 grams	3mm-10mm	3-5	
94	37	18.6 grams	Basal fill of pit 95	Quercus sp. (oak)	37	3.8 grams	4mm-20mm	4-9	
				Alnus glutinous (alder)	3	0.2 grams	3mm	<3	
121	47	0.8 grams	Basal fill of pit 110	Corylus avellana (hazel)	5	0.2 grams	<5mm	<3	

Appendix 7 Faunal Report
By Margaret McCarthy MA

INTRODUCTION

Faunal material was found at over twenty different sites during excavations along the route of the N8 Cashel Bypass and the N74 Link Road dating variously from the prehistoric to the post-medieval periods. The volume of recovered animal bones varied considerably between the sites with relatively large quantities of bones being recovered from a ringfort in Hughes' Lot East (Site 25ii), from a multi-period site (Site 25iv) also in Hughes' Lot East, from a large settlement site in Owens' & Biggs' Lot and from a site in Farranamanagh (Site 41). Animal bones were found in relatively small amounts from sites excavated in the townlands of Ballyknock, Monadreela, Boscabell, George's-Land, Cooper's Lot and Windmill. The excavations revealed evidence of a series of structures and deposits dating principally to the Early Medieval and Late Medieval periods. Relatively large samples of prehistoric animal bone were also recovered from five fulachta fiadh in Owen's & Bigg's-Lot. The animal remains were hand collected and consist almost entirely of mammal bone. A few bird bones were recovered in the samples but not in sufficient quantities to comment on the fowling activities of the occupants of the various sites involved. The total absence of fish bones is not surprising given the inland location of the excavated sites. Many of the recovered bone assemblages are extremely small and the data do little more than indicate the exploitation of certain species. While these samples are too small to reach secure conclusions on diet and economy, the results have nevertheless provided additional information on animal exploitation in this area of South Tipperary during the various periods represented.

METHODS

All fragments were identified to species, or as nearly as possible, using the modern comparative collections of mammals, birds and fish in the Department of Archaeology, University College Cork. Data were recorded onto the Archaeological Services Unit's faunal sheets, which include categories for butchery, ageing and sexing as well as species and element identification. Identifications were taken to species where possible while those fragments for which specific identification could not be made were classed in terms of size and morphological character. The

material recorded as 'large mammal (LM)' in the tables for instance is likely to belong to cattle but was too small to eliminate the possibility of horse and red deer. Similarly, specimens that in all probability were sheep but which may have also originated from goat, pig or large dog were recorded as 'medium mammal (MM)'. The separation of ovicaprid material relied on comparison with reference material and to the discussion in Boessneck (1969). Very few definite elements of goat were recognised and those postcranial bones which allow for discrimination between the two species were all identified to sheep. Ageing data were determined using procedures outlined by Silver (1971) for long bones and Grant (1975) for mandibles. The relative proportion of the different species was assessed using the fragments total only as the samples were considered too small to estimate the minimum number of individuals present.

CONDITION

Bone preservation at those sites which produced reasonably large collections of bone was generally recorded as good with very little evidence for pre and post-depositional alteration. The bones from surface features at all sites were noticeably weathered which suggests that a certain degree of mixing had taken place and eroded brittle fragments, perhaps from earlier phases of occupation, were found together with well-preserved bone. Fragmentation rates throughout were noticeably high resulting in large numbers of bones that could only be classified as large and medium mammal remains. High fragmentation levels at some sites are attributed to butchering and food preparation techniques while the poor conditions of preservation at other sites appear to have led to increased fragmentation. Despite the low counts for dog in all of the samples, gnawing was observed on 7% of the specimens indicating that a certain amount of food waste was scavenged prior to deposition into the various features. The proportion of burnt bone was low indicating that the preferred cooking method at all sites seems to have been by boiling as very few of the bones exhibited signs of charring associated with roasting. A few specimens from the deposits were charred and blackened and this type of damage may have occurred while certain joints of meat were spit roasted over a large open fireplace. The extremely calcined nature of other fragments suggests that bones were occasionally cast into the fire as a means of waste disposal and remained there for a sufficient time to take on the white cracked appearance of heat-shattered bone.

ANALYSIS

Animal bones were recovered from 22 excavated archaeological sites along the route of the road network and the results of the faunal analysis are described below for the Monadreela excavations.

Site 13: 03E0378

Monadreela

The excavation of this site in Monadreela townland produced just a handful of bones and therefore no detailed analysis could be undertaken. The entire sample of just 23 bones came from the fill (C31) of a post-medieval/modern field drain (C2). Five of these are identified as the remains of an adult sheep and consist of elements from the upper forelimb representing a shoulder joint of meat. The remaining 18 bones are classified as medium-mammal fragments probably derived from sheep given that this is the only identified species in the recovered bone sample.

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Appendix 8 Lithics Report

ANALYSIS OF LITHIC ASSEMBLAGES FROM THE CASHEL BYPASS[6]

By Professor Peter Woodman

A selection of 73 lithic artefacts (including two stone axes) and additional lithics in the form of debitage, was recovered from the excavations on the Cashel Bypass. These came from 20 of the excavations carried out during 2003. The assemblage was examined in 2006 and updated, where appropriate to include debitage identified during sieving of soil retents in 2010.

The Cashel Bypass has been strategically located within the Suir valley and in a gap between mountain ranges. The underlying bedrock geology consists of a series of Tournasian and Visean deposits from the carboniferous. Many of these are shales and mudstones rather than limestone. The area also lies within what was traditionally called the Midlandian end Moraine although now, numerous authors would claim that the limits of the Ice sheets of the Last Glacial Maximum extended off the south coast of Ireland. The route of the bypass does not follow the flood plain of the Suir itself, but rather crosses a series of glacial deposits, first to the east and then to the north. Not surprisingly the area, having been heavily cultivated retains few traces of lowland bogs but until recently the Cashel area was dotted with a number of small ponds, many of which have dried out or disappeared. The line of the bypass takes it through areas of primarily relatively low lying land that is often just above 100 m OD.

Condition and raw material

In general, the assemblage from each site was quite small with only one site producing more than 10 pieces while 10 sites each produced less than five artefacts (these figures exclude debitage identified during sieving of retents). The material was overwhelmingly flint with only six struck pieces of chert identified. The one piece of quartz submitted is likely to be from a naturally fractured pebble. Many of the pieces were in a very weathered and/or patinated condition as some were found in secondary contexts and/or in the topsoil.

Table I

TYPES OF RAW MATERIAL

Chert	6
Flint	49
Quartz	1
Natural pieces	17

[6] This specialist report was written in 2006. It was subsequently updated by the author in 2010 following examination of lithics from sample retents. The report has been edited by the NRA Project Archaeologist in 2014 to incorporate data from C14 dates on the Project. A copy of the original report has been retained in the N8 Cashel Bypass site archives.

The flint would seem to have a range of different sources (see below for fuller discussion) while the chert pieces were so rare that it is only possible to note that they ranged from a very fine grained glossy material through to a coarser grained matt form. The natural un-worked pieces of stone took the two forms usual in assemblages from this area. These were damaged, often tabular or nodular pieces of chert and limestone while the other raw material is a metamorphosed fine grained rock that can resemble flint but which is not worked. This latter type of stone is often referred to colloquially as "fool's flint".

Some groups of material would appear to have been found in their original context. The most notable is the struck flint flake (03E0345:07) found along with 11 sherds of Early Neolithic Carinated Bowl pottery from the foundation trench of a circular house, securely dated to the Neolithic period from Site 9 Monadreela; a burnt convex end scraper (03E0418:04) and sherds of Beaker pottery from a pit on Site 34 Windmill dated to 2013–1828 cal. BC (UBA-13786); and flint flakes and a stone axe (03E0378:20) found in association with Beaker pottery and securely dated to the Copper Age, 2457–2204 cal. BC (UBA-13903), from Site 13 Monadreela. It is noticeable that with the exception of one large backed knife from Site 41 and a rather anomalous retouch piece made from a larger flake from Site 7, most of the pieces were either quite small flakes, usually less than 30 mm in maximum length even when intact, while no large blades had survived complete.

From the southern part of the island in general there are few diagnostic implements and it is not uncommon for these artefacts to be found in secondary contexts. Unfortunately with few "Type Fossils" and assemblages of a limited size, where few technological attributes can be identified, it can be difficult to ascribe a particular age to individual pieces or on many occasions, to specific sites.

A significant number of samples were retained for sieving. Besides the expected range of ecofacts that were recovered, a large number of stone items were also retained. In the main these were small pieces of cherty materials, however it was difficult to assess whether these were portions of struck artefacts and only a few showed any signs of attributes that would lead one to believe that they were portions of humanly produced tools. Only those that have clear evidence of being produced through knapping have been included. However the remainder have been retained for future re-examination. Besides the chert items, a number of flint flakes were recovered. Not surprisingly, these were often tiny pieces of debitage that were usually less than 5 mm across. Sieved material has an added advantage in that it provides an opportunity to check whether small microliths have been missed. In situations where there is no strong expectation that they might occur they can be missed, therefore access to sieved residue provides a very useful final check for their presence. In this case no microliths were recovered from the residues. As the sieved material is a product of a different process of collection from that used on the excavations information about this material will normally be appended to the end of the list of artefacts for each site.

Small assemblages would seem to be typical of a large stretch of the southern midlands of Ireland and similar paucities of artefacts have been noted on many new NRA developments. It is tempting to explain away this scarcity as an unfortunate by product of the manner in which excavation has to be carried out, especially, the frequent rapid removal of topsoil. However, the fact that an

extensive excavation at Curraghatoor, Co. Tipperary (Doody 2007) only produced four struck flint flakes is a clear indication that for the Bronze Age in particular there are very low densities of stone tools.

Description of the artefacts

Individual pieces are described and maximum length and width recorded irrespective of whether the piece is complete or not. Where possible the maximum length is taken at right angles to the point of percussion

Site 5 Monadreela 03E0299

03E0299:01

Small fractured portion of a fine grained glossy black chert flake or blade maximum

Length 8 mm maximum, width 6 mm

03E0299:02

This is a broken portion of a large chert blade. The distal tip and a larger portion of proximal end are missing. Two shallow notches have been created in the right lateral edge.

Length 35 mm maximum, width 17 mm

03E0299:03

This is a proximal half of a small black chert blade with signs of platform preparation.

Length 20 mm maximum, width 10 mm

03E0299:04

This tabular, fractured piece of limestone shows some signs of damage rather than retouch. It is probably entirely natural

Comment: This is the only site to produce a majority of pieces in chert. Although it cannot be stated with certainty the two blades would be most at home in a Mesolithic context

Site 7 Monadreela 03E0300

03E0300:01

This is a surface find of a portion of a large creamy beige flint flake. Its' final shape has been determined by irregular, flat though not necessarily invasive retouch. The third edge is created by a flat edge on which there are two long facets. It has obviously been reduced from a much larger flake and may be a failed and therefore abandoned attempt to create a specific but unknown implement.

Length 46 mm maximum, width 28 mm max

Comment: The presence of early Neolithic pottery would suggest that this piece is likely to be Neolithic in date. It does not appear to be Mesolithic nor would it be typical on a Bronze Age site. It would seem as if a large flake tool that had been broken was reworked.

Site 8 Monadreela 03E0379

03E0379:03

This is a cortical flake that has probably been struck from a remaniée pebble of flint. It is in a fresh unpatinated condition. It retains the remnants of some flake steep peripheral scars which have created a straight functional scraping edge.

Length 30 mm maximum, width 21mm

Comment: Cortical flakes are, in terms of periods, undiagnostic though in this case it seems to have been from a remaniée pebble. As there is a greater tendency to use these pebbles in the Bronze Age it seems likely that this site contains at least some traces of Bronze Age occupation.

Site 9 Monadreela 03E0345

03E0345:07

This is the fractured distal end of a large blue grey blade or flake of flint that would have originally been substantially larger.

Length 2.9 mm maximum, width 27 mm

03E0345:09

This is a small weathered nodular piece of black chert. It retains some small flake scars that might have a human origin but is more likely to have been a product of nature.

Length 226mm; width 17.1 mm

03E0345:21

This small piece of glossy black chert may have been a portion of a flake.

Length 6 mm maximum, width 4.5 mm

03E0345:46

A patinated light brown but relatively fresh flint flake whose distal end and part of the lateral edges are missing. The striking platform is cortex covered. The remaining right lateral edge retains evidence of slight peripheral retouch.

Length 36 mm maximum, width 35 mm

03E0345:04

Natural chunk of chert retrieved from sieved material.

Comment: The presence of two larger flakes would suggest a platform technology that was present to a greater extent in the Neolithic.

Site 11 Monadreela 03E0346

03E0346:03

This possible piece of coarse granular flint may have been struck.

Sieved Material

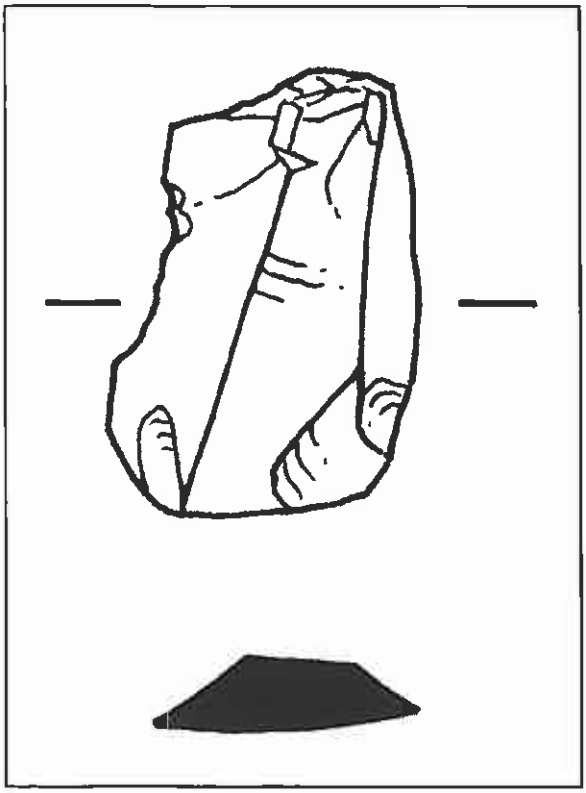
While large quantities of tiny fragments of predominantly chert were recovered from sieved material, none could be stated with certainty to be struck

Site 13 Monadreela 03E0378

03E0378:12

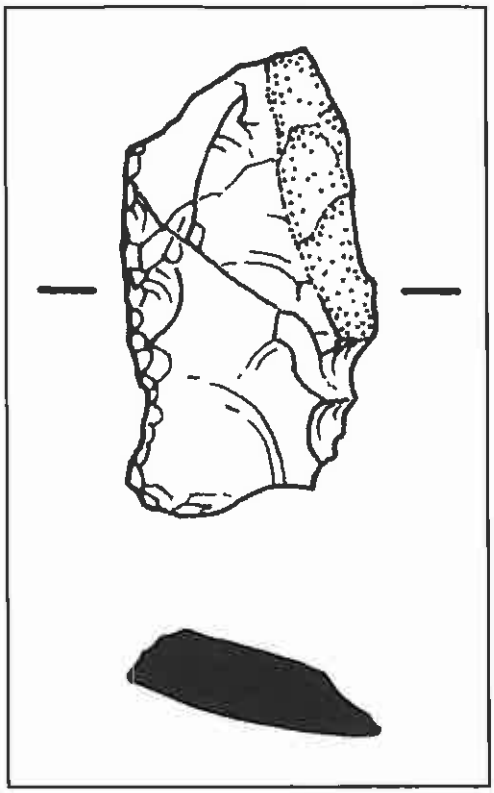
This is a small fresh laminar blade of flint.

Length 21 mm maximum, width 13 mm



App. 8.1: 03E0378:12

03E0378:13
A heavily burnt mid portion of a flint blade was recovered as a surface find. It retains some steep retouch on its left lateral edge.
Length 27 mm maximum, width 17 mm maximum

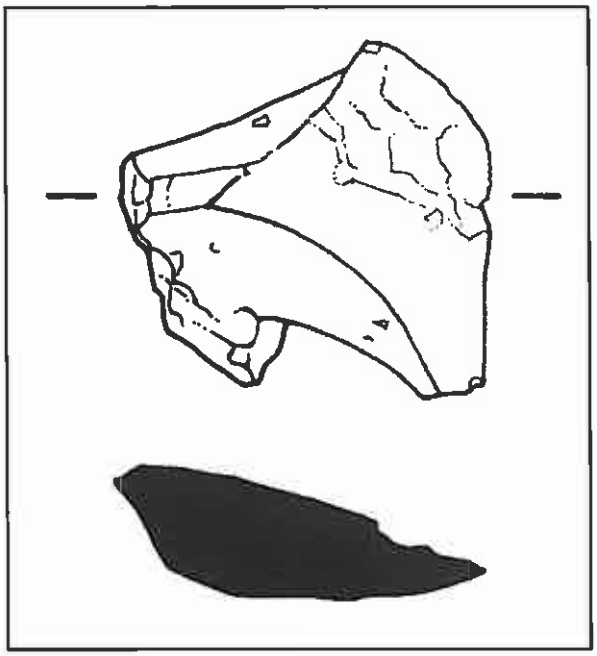


App. 8.2: 03E0378:13

03E0378:18

This unretouched flint flake shows signs of burning.

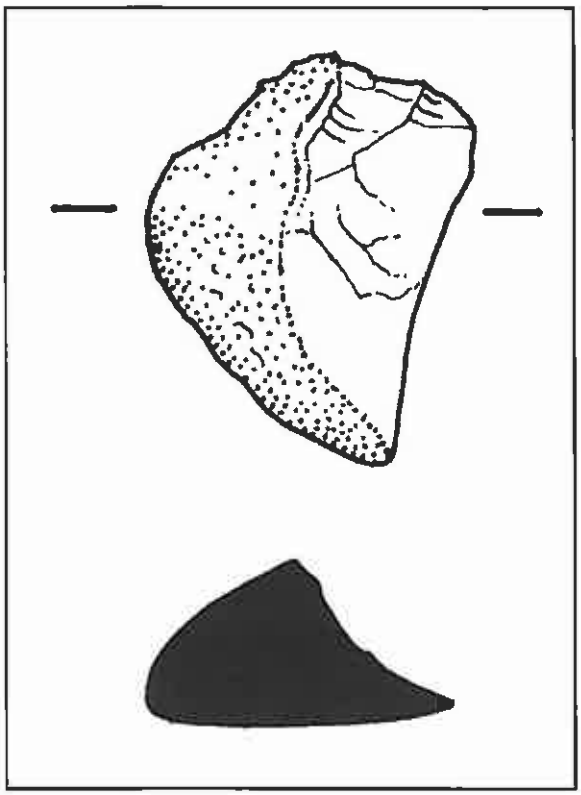
Length 26 mm maximum, width 26 mm maximum



App. 8.3: 03E0378:18

03E0378:19

This is a heavily burnt portion of a secondary cortical flake whose cortex shows signs of heavy damage.
Length 21 mm maximum, width 22 mm



App. 8.4: 03E0378:19

03E0378:20

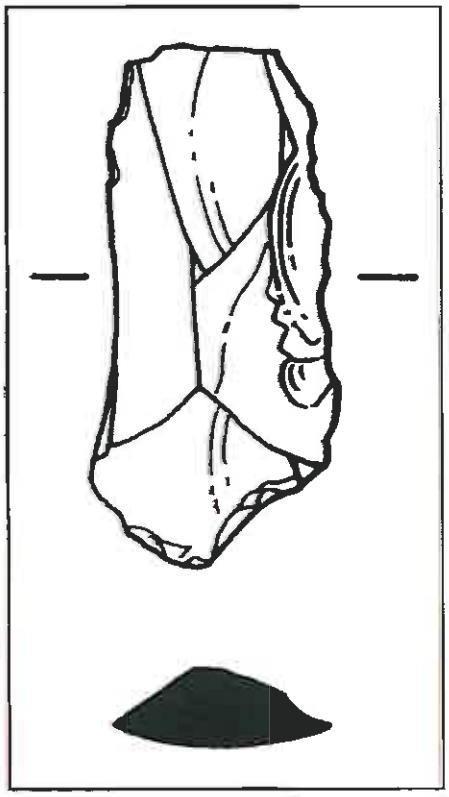
This is a small almost perfect polished stone axe. Its present almost squat outline may be slightly exacerbated by the fact that a small portion of its butt is missing. The broken surface has either been heavily used or suffered from an attempted reworking. The cutting edge is in such good condition that it is almost certain that the axe was not, as commonly happened, used as a wedge at a later date. Aside from the damaged butt end the axe has been polished overall, with the lateral edges being created by flat facets. Both upper and lower surfaces are relatively flat.
Length 62 mm maximum, width 42 mm

App. 8.5: Polished stone axe 03E0378:20

03E0378:23

This is a small, very fresh flint blade of slightly irregular shape. The distal tip is missing.

Length 33 mm maximum, width 15 mm maximum

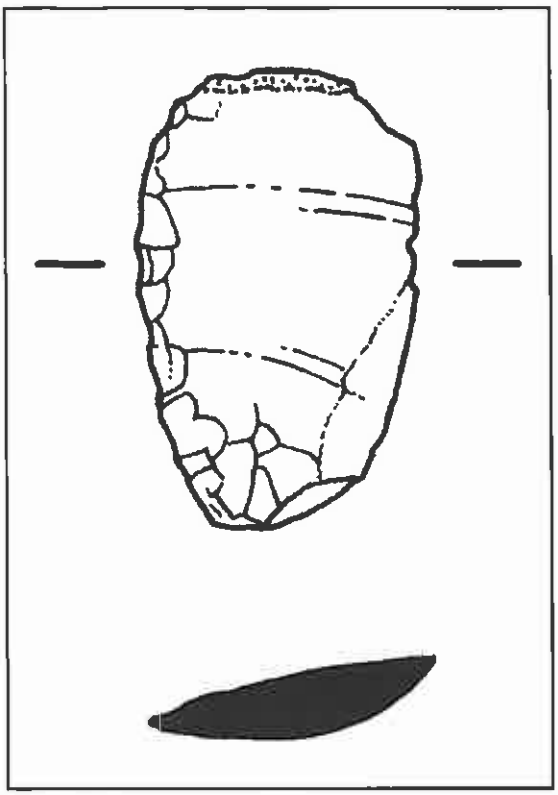


App. 8.6: 03E0378:23

03E0378:24

This is a small fresh flake fragment that may have been struck from a small bi-polar core.

Length 25 mm maximum, width 14 mm



App. 8.7: 03E0378:24

03E0378:26

This is a very small flake that may have been produced during secondary retouch.

Length 9 mm maximum, width 7 mm maximum

03E0378:28

This is a small flake of flint.

Length 11 mm maximum, width 12 mm maximum

Sieved material

From context (85) pit [83], four small flakes of flint (03E0378:208, 03E0378:209, 03E0378:210 & 03E0378:227) that could also be described as debitage (less than 20 mm in maximum length). All are in fresh condition with one slightly burnt and one retaining a small area of beach chattered cortex 03E0378:227. In addition, 53 small pieces of debitage many of which were burnt.

03E0378:208

Small flake of flint that could be described as debitage (less than 20 mm in maximum length).

Length 20 mm; width 15 mm; thickness 6.9 mm

03E0378:209
Small flake of flint that could be described as debitage (less than 20mm in maximum length).
Length 20 mm; width 15 mm; thickness 0.7 mm

03E0378:210
Small flake of flint that could be described as debitage (less than 20 mm in maximum length).
Length 33.9 mm; width 37.8 mm; thickness 6.9 mm
Comment: The lithic assemblage from this site is in general quite undiagnostic. Most pieces have come from pits or as in one case, a post hole. It is of interest that there is a polished stone axe associated with Beaker pottery and while small square axes can be found in the Mesolithic and the Neolithic period, in this case the resemblance of the shape of the axe to early copper axes may not be coincidental. 03E0378:13 (surface find) could either be Mesolithic or Neolithic in date.

The Significance of the assemblages

Raw materials

In general within what could be described as the eastern part of North Munster and adjacent parts of Leinster, many of the assemblages are dominated by flint rather than chert or other raw materials. Only one site on the Cashel bypass, i.e. Site 5 Monadreela contained a majority of chert artefacts and this case it was three pieces out of four. Therefore it is quite usual to find, within the assemblages from this region, that flint is the dominant raw material. In general this would seem to be the case irrespective of period and is apparent at Ballybrado which lies further south, on the River Suir (Finlay and Woodman 2001, 189) and which seems to contain an early Mesolithic element. This is also the case at Kilcummer Lower, overlooking the River Blackwater, Co. Cork (Anderson 1993) and Killuragh Cave Co. Limerick (Woodman 2003). The same pattern can be seen in many Neolithic and later assemblages e.g. Curraghatoor and Chancellorsland (Doody 2007 & 2008). Often closer to the Shannon a higher percentage of chert can occur; e.g. at Hermitage, Co. Limerick chert was more common and it could be the dominant material on many sites from across the Shannon river in County Clare (Collins & Coyne 2003, 27).

The flint material found on sites in the Cashel bypass is likely to be either erratics or the small remaniée pebbles that are so prevalent in the area. Some material may have been brought from the coast about 60 km to the south but there is little evidence that flint was imported from the north of Ireland. The two pieces that may have been imported from are the large backed knife from Site 30iii (**03E1086:47**) and the large irregularly retouch fragment Site 7 (**03E0300:01**). The hollow scrapers would have required well chosen nodules or largish pieces of flint that may not have been immediately available in the area. This may have also been the case with the two large blade fragments from Site 41 (**03E0674:08** & **03E0674:61**). Most of the chert appears to be rather small almost opportunistic flakes with only the blade fragments Site 5 (**03E0299:02** & **03E0299:03**) and obviously the chert arrowhead Site 41 (**03E0674:23**) is likely to have been imported. As noted by Woodman and Scannell (1993) a high proportion of the arrowheads found in Munster are made from chert. Therefore the limited lithics assemblage is made up of the use of some local quite impoverished sources combined with a limited use of good quality flint brought in from outside the immediate area.

The chronological sequence

The Mesolithic: Mesolithic artefacts within this part of North Munster are quite rare indeed Co. Tipperary would be one of the counties with the least number of recorded find spots noted in the Mesolithic Data Base. It fits easily within the bottom quartile of the Data Base. As much Mesolithic material tends to come from the centre of river valleys, lakes and coastline it is not surprising that few Mesolithic artefacts were recovered. While Site 41 Farranamanagh lies adjacent to the headwaters of several streams flowing into the River Suir, the bypass route does not cross any rivers. Finds of Mesolithic artefacts in this type of landscape occur but usually they are stray finds which are often Later Mesolithic.

As noted above, local raw materials would not have been of a sufficient quality or quantity to allow extensive local production therefore some pieces were probably brought in from coastal areas outside the Cashel region. In the Mesolithic it is possible that many pieces brought into the area would have been curated and not easily abandoned, thus finds especially diagnostic tool types will be rare. Perhaps the most interesting yet enigmatic pieces are (**03E0674:08 & 03E0674:61**) which were removed from the same linear feature of later date at Site 41 Farranamanagh. These are two blade fragments of which one (**03E0674:08**) is slightly retouched. They have all the appearance of being portions of large blades that would be unusual in both the later and earlier Mesolithic. While they could belong within the Early Mesolithic, one possible explanation is that they come from a phase at the very beginning of the later Mesolithic, certainly before 6000 cal BC. The transversely retouched blade is particularly difficult to parallel in except that it gives the impression of being very early. {On Site 39 Farranamanagh, to the southeast oak charcoal from fill (217) of pit [216] was radiocarbon dated to 6372–6098 BC (UBA-14360)}.

There would also appear to have been traces of early Mesolithic settlement at Site 36i. This is an area where most of the lithics were recovered from topsoil or the soil dumps from the original clearing of the road line. The fact that three reasonably high quality blade cores (**03E0675:05**, **03E0675:49** & **03E0675:52**) were recovered in circumstances that would not suit the recovery of lithics suggests that an early Mesolithic site might have existed at one time in the past. It is likely that blade fragments would not be noted while it is improbable that microliths would have been noted.

The one probable later Mesolithic artefact is the flint knife (**03E1086:47**) from Site 30iii (Area 2). As noted earlier this is a particularly fine and unusually well retouched piece. This piece could probably date to the latter part of the Later Mesolithic. {Approximately 100 m from this find spot elm charcoal from fill (8017) of gully [8018] was radiocarbon dated to 6206–5999 BC (UBA-13940)}.

Only three other potential Mesolithic items were recovered. These were the proximal portion of a small chert blade, Site 5 Monadreela (**03E0299:03**) that might belong to the Mesolithic while (**03E0299:02**) is apportion of a larger blade that is also struck from a chert nodule. A surface find from Site 13 Monadreela (**03E0378:13**) was an extremely heavily weathered burnt blade fragment. Its steep peripheral retouch was more reminiscent of what might be expected to be found in a Mesolithic context but this latter piece could also date to the Neolithic.

In summary, the Mesolithic is represented by a scatter of stray finds usually occurring out of context. There seems to be a slight concentration to the south and southwest of Cashel. It is of interest that two of the sites that have produced potential Mesolithic artefacts over looked ponds or small lakes

that would have existed in the earlier half of the Holocene. These are Site 41 Farranamanagh which overlooks Lough Nahinch and Site 5 Monadreela which lay adjacent to a marshy area associated with a pond.

The Neolithic: There was one Neolithic rectangular house excavated on the Cashel bypass scheme, Site 19 Boscabell (03E0426). There are few sites with early Neolithic stone tool assemblages. In fact, the one large bifacial form / leaf shaped arrowhead from Site 41 Farranamanagh (**03E0674:23**) is one of the few artefacts which might belong to the earliest phases of the Neolithic. In general, it is the presence of hollow scrapers and their blanks that are the most obvious Neolithic presence. The hollow scraper would appear to develop some time after the beginning of the Neolithic though probably by 3500 cal. BC. The most obvious presence is at Site 30iii (Area 1) where three hollow scrapers was found in close proximity. These (**03E1086:48**, **03E1086:49** & **03E1086:60**) were in the vicinity of a small structure. They may be part of a small cache of hollow scrapers that had been brought there for a particular purpose (Woodman et al 2006). One other hollow scraper blank was found as a stray. This was a topsoil find at Site 41 (**03E0674:01**). Hollow scrapers were traditionally regarded as a northern phenomenon but thanks to numerous recent excavations in Munster they are beginning to occur with a greater frequency. Examples have been found at Killuragh Cave Co. Limerick (Woodman 2003). It would seem that their absence was due to the lack of excavations of the appropriate sites.

No other diagnostic Neolithic artefacts such plano-convex knives, invasively retouched pieces etc were recovered from the Cashel bypass. However the platform technology from a small assemblage from Site 9 Monadreela would be more typical of the Neolithic period.

Other implements that were recovered are less diagnostic and difficult to attribute to a particular period. Therefore of the four scrapers only two can be clearly associated with a particular period and in both cases this could be confirmed by associations. These were the small domed scraper from Site 39 Farranamanagh (**03E0757:22**) is typical of those often found on sites with beaker assemblages as happened in this case. Other more fragmentary and irregular examples such as Site 36i Windmill (**03E0675:48**) are more likely to be Bronze Age.

This area is noted for the presence of bi-polar cores made on remaniée pebbles though in this case few good examples exist. One particular good example was recovered from Site 36ii Windmill this is (**03E0676:66**) while (**03E0676:40**) from the same site is a flake also struck from a remaniée. The other good example of a flake from one of these pebbles is Site 8 Monadreela (**03E0379:03**) while lithic (**03E0746:35**) from Site 25iii Hughes'-Lot East is from a site with Early Bronze Age pottery. The bi-polar technology is known to continue into the later part of the Bronze Age e.g. at Fota Island in Co. Cork (Woodman 1994). It is possible that these remaniée pebbles were recovered more frequently when more agricultural land was opened. In fact, they were first noted by O Kelly (1963) when searching a ploughed field adjacent to Garryduff ringfort.

Although they are not always that common, the lack of diagnostic tools such as barbed and tanged and hollow based arrowheads, as well as slug knives, etc is quite striking. Woodman and Scannell (1993) noted that stray finds of arrowheads in many parts of Munster were quite rare. This scarcity of

the more diagnostic tool types would seem to be being replicated in the various NRA projects. Obviously, with the smaller quantities of stone tools that are recovered from Bronze age settlement sites, the Bronze age presence is not always very obvious, but it is evident from the pottery that there is a significant Bronze age presence in the area.

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Summary Table of potentially diagnostic elements

Mesolithic

Site 5 Monadreela - Possible Early Mesolithic?

Site 30iii Owen's And Bigg's-Lot - Probable Later Mesolithic backed knife

Site 36i (Area 2) Windmill - Probable Early Mesolithic blade cores

Site 41 Farranamanagh - Probable Earlier Mesolithic blade and retouched blade fragment

Earlier Neolithic

Site 7 Monadreela - Large reworked and retouched flake fragment

Site 9 Monadreela - Typical platform core technology associated with the Neolithic

Site 30iii (Area 1) Owen's And Bigg's-Lot - Three hollow scrapers

Site 41 Farranamanagh - Unfinished leaf shaped arrowhead and hollow scraper blank

Beaker and Bronze Age

Site 34 Windmill - Invasively retouched convex end scraper with burial

Site 39 Farranamanagh - Typical small beaker period domed scraper

Site 8 Monadreela - Cortical flake from remaniée pebble

Site 13 Monadreela - Possible bi-polar technology

Site 25iii Hughes'-Lot East - Possible bi-polar technology

Site 36ii Windmill - Bi-polar core present

Site 38ii Deerpark/ Farranamanagh - Cortical flake from remaniée pebble

Appendix 9 Monadreela Petrography Report

Identification of Stone Artefacts from

the N8/M8 Cashel Bypass –

Monadreela Townland

Client –

South Tipperary County Council,

County Hall,

Emmet Street,

Clonmel.

Service provided by:

RUNITT Geological and Geoarchaeological Services, Tig na gClocha, Carrigadrohid, County Cork Tel: 087 6847622 Email: r.unitt@ucc.ie

Identification of Stone Artefacts from the N8/M8 Cashel Bypass – Monadreela Townland

Introduction

This report describes the petrography of stone finds uncovered during the development of the N8/M8 Cashel Bypass from the Monadreela Townland.

The report includes an introduction to the local geology and a description of the stone finds and their probable provenance.

Geology of Cashel and the Adjacent Areas of County Tipperary

The geology of Cashel and surrounding areas is composed entirely of Carboniferous aged rocks (355-290 million years ago) with a variable covering of glacial sediments. The Carboniferous rocks are sedimentary in nature having formed in environments ranging from warm shallow seas to swamp-filled river deltas.

The oldest rocks are composed predominantly of limestone deposited in warm shallow equatorial waters during the Lower Carboniferous period. Differences in the limestone and its associated rocks have meant that they have been divided into a number of separate 'Formations'. The following is a list of the 'Formations' and their distinctive geological characteristics.

The 'Durrow Formation' is found to the north and west of Cashel and consists of fossiliferous limestone and shale, characterised by coral-bearing shale and thick muddy limestone.

The 'Suir Formation', occurring from north-west to south-west of Cashel, consists of pellety bioclastic limestone or cross-bedded oolitic grainstone.

The 'Ballyadams Formation' can be found to the north, south and east of Cashel and consists of pale-grey limestone. Characteristic features include thick-bedded colonial coral-bearing bioclastic limestone. In many outcrops large lithostrotian coral colonies are found.

The 'Lagganstown Formation', occurring to the south and west Cashel, consist of thick-bedded shaly limestone with seams of irregular chert nodules.

The 'Hore Abbey Formation', which forms the Rock of Cashel as well as other areas to the west and south-west, consists of many different limestone types and can be very rich in chert.

The 'Clogrenan Formation', occurring north-east to south-east of Cashel, consists of blue-grey, crinoidal, cherty limestone.

The limestone 'Formations' are overlain by sandstones and shale of Upper Carboniferous age, representing a regression of the sea to the south to be replaced by large deltaic systems. Outcrops form the Slieve Ardagh coalfield and extend to areas east, north and west and Cashel. The rocks are again separated into 'Formations' dependant upon their distinctive geological characteristics.

The 'Killeshin Formation' overlies the limestone via a disconformity (break in deposition/erosion). The Formation consists of dark-grey mudstone with minor flaggy sandstones and occasional nodules (bullions) of iron-carbonate cemented clay-stone.

The 'Breggaun Flagstone Formation' occurs in small areas to the north and east of Cashel and consists of micaceous sandstone and silty shale.

The bedrock geology is overlain by a mixture of glacially derived unconsolidated sediments, alluvial sediments associated with the local watercourses and a variety of subsoils and soils derived from both the bedrock and superficial deposits.

Monadreela (Sites 7, 8, 9, 13, 14)

Monadreela Townland is predominantly underlain by mudstone and sandstone of the Killeshin Formation including the distinctive Ballynock Hill.

Stone finds contain a mix of artefacts including a mortar, hones, a possible hammerstone and a fishing weight. This mix of tools is made from local rocks that would have been readily available either directly from outcrop, from glacial sediments or from river alluvium.

The life of some artefacts may have been extended if they were constructed of a material that was suitable for honing metal tools. The 'rough mortar' may have been used initially as a mortar or may be a discarded fragment that broke during the construction of a mortar. The probable hone marks on the base of the fragment shows that this coarse material will often have an alternative use.

A polished quartz pebble may have been some form of keepsake (personal totem) for an individual.

Conclusions

All the stone artefacts from the Monadreela Townland appear to have been derived from local sources. Although outcrops of rock are not always readily available, stream sections through glacial and alluvial material often provide easily accessible stone material.

Catalogue of Stone Finds from Monadreela Townland

Site 07

03E0300:02 – Perforated shale: possible pendant hone – dark brown, weathered pale green-brown to grey-brown shale broken along natural fractures.

Site 08

03E0379:04 – 'Rough mortar': grey, weathered pale-brown, medium grained sandstone/greywacke. Scoring on underside are possible hone marks.

Site 09

Surface Find – Fishing weight?: grey, crinoidal limestone with eye-shaped 'worked' hole.

03E0345:10 – Hone: dark grey-green, fine-grained sandstone.

03E0345:11 – Natural: pale grey-green, fine-grained sandstone pebble.
03E0345:42 – Rounded quartz pebble.

Site 13

03E0378:15 – Vein Quartz: polished vein quartz with iron staining.

03E0378:16 – Hammerstone?: Grey to white (heat affected), medium to coarse-grained, banded sandstone.

Site 14

03E0395:01 – Natural: grey cherty limestone with partly de-calcified crinoid fossils.

Appendix 10 Prehistoric Pottery Report

The prehistoric pottery assemblages from the N8 Cashel Bypass, Co. Tipperary

Dr. Eoin Grogan and Helen Roche

Summary

The N8 Cashel Bypass produced a substantial assemblage of 638 sherds (plus 156 fragments and 260 crumbs) from at least 73 vessels. This material came from 15 sites and weighed a total of 5,150g. There were small quantities of early Neolithic Carinated Bowl (five sites and at least nine vessels), and early Bronze Age food vessel (two sites, two vessels) but the assemblage was dominated by final Neolithic/early Bronze Age Beaker (11 sites, 66 vessels). Collectively the sites indicate intensive prehistoric settlement in the Cashel area.

The early Neolithic

Five sites, Gortmakellis (Site 1i), Monadreela (7, 9 & 13) and Boscabell (19) produced small assemblages of Carinated Bowls representing at least nine vessels (Tables 1 and 3). The quantities of pottery were small with a total of 34 sherds (150g); in general the material came from pits and postholes without any clear structural pattern. The pottery from Monadreela 9, however, was in a posthole that may have been associated with a small circular structure. All of the contexts appear to be domestic and this is reflected in the fragmentary and worn condition of the pottery.

The vessels are all well made and fine-walled with a thickness of generally less than 7.5mm. They all appear to have everted rims and simple rounded or small step shoulders. Both gently rounded shallow bodies and more deeply rounded profiles are present. The red-brown to dark grey fabric contains mainly crushed quartzite inclusions (≤ 2mm long) but some mica also occurs at Ballyknock Site 1i (Vessels 2and 3) and the Boscabell 19, Vessel 1, contains shale. Two pots, Ballyknock Site 1i, No. 3 and Monadreela 7, No. 1, retained evidence for burnishing but it is probable that wear has obscured this feature on other vessels.

Discussion

The N8 Cashel Bypass vessels have a wide variety of parallels on other Neolithic domestic sites, including those with characteristic early Neolithic rectangular houses, and early court tombs. The vessels are plain carinated bowls and this form consists of a hemispherical bowl above which there is a distinct shoulder or carination and a generally curved neck and a simple, often slightly out-turned, rounded rim. Vessels of this type in Ireland usually have deep bowls and neutral or open profiles, *i.e.* where the shoulder diameter is equal to or less than that of the rim. These forms represent the earliest type of Neolithic pottery (Case 1961: 'Dunmurry-Ballymarlagh styles'; Sheridan 1995: 'classic' carinated bowls) in Ireland.

This type of pottery has not previously been reported from the Cashel area. At a regional scale, however, early carinated bowls with everted rounded rims, curved necks and simple angle or small step shoulders feature at Lough Gur Circles J, K, L and Site 10 (Grogan and Eogan 1987, figs 15, 20, 27, 40-41, 67), and Site C (Ó Ríordáin 1954, fig. 11), Co. Limerick. This pottery also came from a pair of rectangular houses at Tankardstown South, Co. Limerick (Gowen 1988; Gowen and Tarbett 1988), and more recently from houses at Granny and Newrath, Co. Kilkenny (Hughes 2005; Wren 2005). Recent discoveries in the south-east at, for example, Kerlogue, Co. Wexford, Ahanaglogh, Cooltubrid East and Knockhouse Lower, Co. Waterford (Elder 2004; Tierney *et al.* 2002; McQuade forthcoming) are indicating a much more extensive settlement pattern during this period. Similar results have also occurred in Cork with early Neolithic pottery from sites such as Ballinaspig More and Curraheen (Danaher 2004a; 2004b). Carinated Bowls are well dated from a variety of sites to the period 4000-3700 BC.

Townland (Site No.)	Weight	Sherds	Rim		Neck	Body	Frags.	Crumb	Minimum Vessels	Pottery type
Ballyknock (1i)	60	8	0	3	2	3	0	0	4	ENCB
Monadreela (7)	25	9	1	2	3	3	0	0	1	ENCB
Monadreela (9)	25	9	0	2	7	0	0	0	2	ENCB
Monadreela (13)	0.25	1	0	0	1	0	0	0	1	ENCB
Boscabell (19)	40	6	0	2	4	0	0	0	1	ENCB
Owen's and Bigg's Lot (30)	10	3	1	0	0	2	2	12	1	Bowl FV
Windmill (34)	10	1	1	0	0	0	0	0	1	Vase FV

Table 1. Early Neolithic Carinated Bowls and early Bronze Age food vessels from the N8 Cashel Bypass.

The final Neolithic/early Bronze Age

Beaker pottery came from 11 sites and the total assemblage from these consisted of 633 sherds (plus 173 small fragments and 350 crumbs) representing at least 66 vessels (Table 2). There were two large individual assemblages from Monadreela 13 (135 sherds, 12 vessels) and Windmill 36Bii (332 sherds, 27 vessels) but significant quantities also came from Farranamanagh 38ii and 39.

Townland (Site No.)	Weight	Sherds	Rim	B/Ba	Neck	Body	Frags.	Crumb	Fine/ domestic	Min. No. Vessels
Monadreela (13)	1831	147	15	20	36	76	14	141	6/6	12
Boscabell (18)	30	9	0	8	1	0	0	0	2/0	2
Boscabell (19)	2	1	0	0	1	0	0	0	0/1	1
Boscabell (20)	25	4	0	0	1	3	0	0	2/0	2
George's-Land(22)	5	2	0	0	1	1	0	0	2/0	2
Hughes'-Lot East (25iii)	344	22	3	2	2	15	10	15	3/0	3
Windmill (34)	12	1	1	0	0	0	3	13	0/1	1
Windmill (36)	10	3	0	0	3	0	0	0	1/0	1
Windmill (36i)	60	11	2	1	7	1	2	2	3/1	4
Windmill (36ii)	2370	339	30	19	91	199	82	21	18/9	27
Farranamanagh (38)	340	52	8	7	20	17	37	27	8/0	8
Farranamanagh (39)	125	42	2	0	3	37	25	131	2/1	3
	5154	633	61	57	166	349	173	350	47/19	66

B/Ba = base/base-anglesherds

Table 2. Beaker pottery from the N8 Cashel Bypass.

Condition, form and size

The assemblage contains both fine and 'domestic' pottery. The latter term is generally used in Ireland for larger heavier vessels often with less formal decoration[7] but it should be stressed that all of the N8

[7] Other terms, such as 'coarse' Beaker or 'rusticated' ware have also been used to refer to this material. Often, as on the N8 project, this material, while heavier, is not appreciably 'coarser' than the so-called 'fine' wares. Rustication refers

material is domestic in context and function. Of the 58 vessels identified 41 are fine vessels of which 10 are undecorated examples while there are 17 domestic pots. Fine and domestic vessels occurred together at four sites while four others had only fine pottery (Tables 2 and 3). Several vessels, including Monadreela 13.8 and 10, a pot at Windmill 36Bii represented by a single sherd (**640**.246[8]) as well as Vessels 12 and 16, and a pot at Farranamanagh 38ii represented by a group of sherds (**753**.[31a-b], 32-3), have burnt accretions that indicate that they were used for cooking. The use and post breakage history of the fine vessel No. 8 from Monadreela 13 is particularly interesting: it had been used in a domestic context and after breakage part of it, represented by a few burnt sherds, had been in contact with intense heat, probably in a domestic fireplace. Some of the burnt sherds re-fit with unburnt examples. Post-breakage burning was also identified on Vessel 10. Variable treatment of broken vessels is also demonstrated by material from Vessel 5 with some heavily abraded examples joining with unworn sherds. Wear, to both surfaces and edge breaks, is common throughout the assemblage and a large number of vessels are represented by only a few sherds: this is a feature of pottery from, and deposited in, domestic contexts.

The pottery is of good quality in terms of both production and decoration although a limited range of decorative styles is present. It was possible to reconstruct complete profiles for only a small number of vessels. Nevertheless, it appears that all had an S-shaped profile although there is a preponderance of very gently concave necks. Monadreela 13.5 has a short, very sharply curved neck. Most of the assemblage have gently rounded bellies and appears to have had soft S-shaped profiles. Only a small number, including Windmill 36Bii.2 and 10, have an angular belly marking the junction between the neck and the body; in these cases the body may have been relatively short. Most of the vessels have simple unfooted bases but those with a slight or even slightly protruding foot also occur. High footed bases, such as Windmill 36Bii.27, are more rarely present. The identifiable base diameters vary from 5.5-12.0cm with those over 9cm representing large vessels.

The vessel wall range in thickness from 4-8mm but the domestic vessels are generally thicker (8-10mm, up to 11mm). The clay and inclusions appear to be reasonably homogenous throughout the assemblage; there is some difference in the final finish quality, with a small number of vessels, including Monadreela 13.3 and 13, Windmill 36Bii.1-2 and 11, Farranamanagh 38Bii.4 and necksherd 701.1, having a burnished finish. Other particularly well-made and finished vessels include Windmill 36Bii.2-5, 8, 21-22, 15 and 16, and Farranamanagh 38ii.7 and 8.

The fabric is good to fine containing a moderate percentage of crushed inclusions generally less than 2mm in length but occasionally up to 5 by 4mm. Quartzite (43%), quartzite and one or more other (85%) while there are a few examples of vessels that contain only one other inclusion type (sandstone [2], shale [1] or grog [2]). There are 11 vessels that contain shale inclusions and 11 have sandstone but only two, both from Windmill 36Bii, contain both materials. Shale is the only inclusion that is differentially distributed between the fine and domestic pots: 37% of domestic, but only 10% of fine vessels contain this material. Small felsite particles also occur in three pots. A slightly surprising element in the assemblage is the presence of grog temper in 15 vessels (26%). Grog has been identified in a very small number of Irish assemblages including Knowth and Newgrange, Co. Meath (Brindley, J. 1984), and Mell, Co. Louth (McQuade 2005; Roche and Grogan 2005)[9]. It appears in vessels from Monadreela 13, Windmill 36Bii and Farranamanagh 38ii in both fine and domestic examples.

In most instances it has been possible only to estimate the size of the vessels but more exact dimensions are provided for 16 examples. There was a single small example with a maximum rim diameter of 9.8cm (Monadreela 13.2, Fig. 2), medium sized vessels (10-16cm) included 11 fine and five domestic pots and there were six large (16cm+) domestic examples. In addition more general size estimates were possible for 21 vessels: these consist of one small pot, seven medium and 14 large

specifically to decoration with fingernail, or sometimes bird bone, impressions frequently arranged haphazardly over the entire vessel.

[8] Throughout this report context numbers are in **bold**.

[9] Grog is crushed fired clay and can usually only be clearly identifiable within the enclosing matrix under polarised light (Brindley, J. 1984, 332).

examples. Overall there were two small fine pots, 17 fine and 6 domestic vessels of medium size, and eight large fine vessels and 12 domestic examples.

Decoration

The majority of the vessels, both fine and domestic, bear some form of decoration. A wide variety of techniques are represented and there are 43 decorated vessels. A small number have comb impressed ornament including Monadreela 13.1, Boscabell 20.2, Windmill 36Bii.1 and 3, and Farranamanagh 38ii.1. A similarly small sample including Windmill 36Bii.1-3 and 8 (Fig. 1), Farranamanagh 38ii.2 and 3 have cord impressed lines.

The typical decorative arrangement consists of bands of horizontal lines alternating with blank zones: these lines can be cord (Windmill 36Bii.2, 3 and probably No. 8, Fig. 1) or comb impressed lines (Windmill 36Bii.1, Farranamanagh 38.1) but incised decoration is more common (Windmill 36Bii.5-6, 21, 27, Farranamanagh 38ii.2, Fig. 2). An unusual feature on Windmill 36Bii.5-6 is the scoring from an acute angle leaving a distinctive lip or overhang on each line. This alternating pattern combined with fringes of short scores or impressions within the blank zones occurs at Windmill 36Bii.1 and Farranamanagh 38ii.1 and 7 (where the pattern also occurs on the inner face, Figs 1-2). Several vessels, including Windmill 36Bii.1-2 and Farranamanagh 38ii.2-3, have short internal bands of two-three lines of horizontal cord lines immediately beneath the rim (Fig. 1). There are two vessels with low, pinched-up, cordons within the curve of the necks: on Windmill 36Bii.4 this decorative treatment is combined with banks of incised horizontal lines and blank zones while at Windmill 36i.1 there are rows of closely spaced stab marks.

These motifs, with incised, comb or cord impressed lines, represent the most common decorative arrangement on Irish Beakers and occur, for example, at Knowth concentrations B, C, and D (Eogan 1984, 266-8, fig. 94.1565-95, fig. 95.1596-1618, 277-80, figs 100-1, 294, fig. 110), Site 5 Dalkey Island, Co. Dublin (Liversage 1968, 72, fig. 8.p51-2), Lough Gur, Co. Limerick, Sites C, D (including a reconstructed example; Ó Ríordáin 1954, 277-8, pls 36-7, and 394, fig. 36.1-12,), L (Grogan and Eogan 1987, 407, fig. 46) and 10 (Grogan and Eogan 1987, 451, fig. 68.V.5 and V.6). This decorative treatment dominates the assemblage at Kilgobbin, Co. Dublin (Hagen 2004; Grogan 2004), and is also represented at Mell and Newtownbalregan 6, Co. Louth, (Grogan and Roche 2005a). Other decorative treatment consists of oppose pairs of finger- and thumbnail impressions arranged in horizontal rows (Farranamanagh 38.ii.4 and 39.2). The lower body of Farranamanagh 39.1 has a wide band of oblique scored bordered, below, by a band of finely incised horizontal lines.

Another common feature of Irish Beaker ornament is the use of filled panels that alternate with blank zones. This is rare in the N8 assemblage but occurs on Monadreela 13.1 that has a band of slightly off-vertical comb impressed lines bordered by horizontal comb lines (Fig. 2). Another example is the small vessel No. 1 from Boscabell 20 that has a comb impressed chevron frieze also bordered by comb lines.

There are two unusual vessels in the assemblage. While the overall decorative arrangement on Windmill 36Bii.1 is readily paralleled the tall narrow shape is unusual (Fig. 1). A similar general shape occurs in a tall vessel at Dalkey Island that has, however, a large applied cordon high up in the neck and a sharply angular belly (Liversage 1968, 72, fig. 7.p48). Vessel 4 from Monadreela 13 is an exceptionally finely made pot that may have been burnished; the external surface is plain but there are evenly horizontal spaced ridges or low cordons on the upper inner surface.

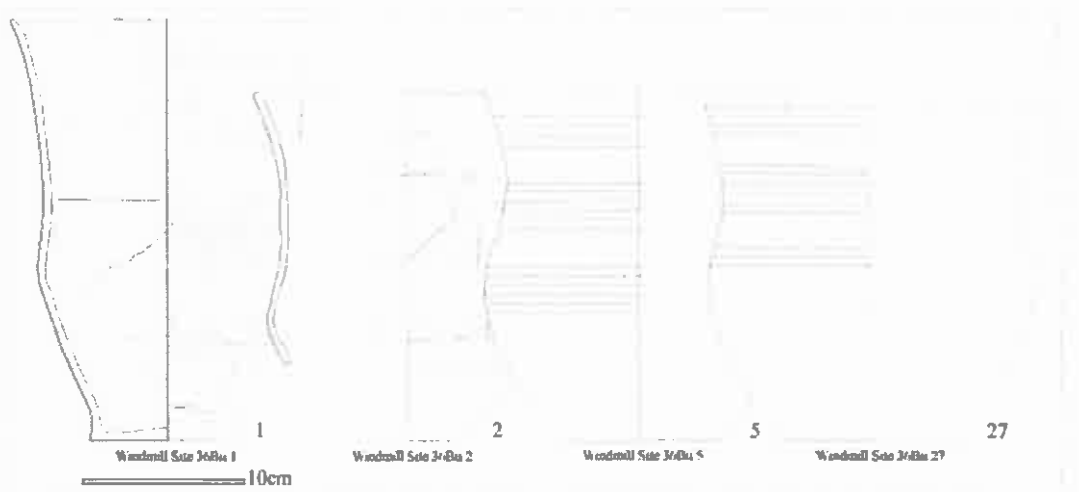

Fig. 1. Conjectural reconstruction of fine Beaker vessels (1, 2, 5 and 27) from Windmill Site 36Bii.

Undecorated pottery

There are nine plain fine pots including examples from Monadreela 13 (3), Windmill 36i [1] and 36Bii (5)(Fig. 2). There are also three plain domestic vessels from Monadreela 13 (2) and Windmill 36ii [1]. Vessels with applied or pinched-up cordons, although otherwise undecorated, include a fine pot from Monadreela 13 and domestic examples from this site as well as Farranamanagh 39. This type occurs in several assemblages as at Newgrange (Cleary 1983, 78, fig. 29) and Knowth concentrations B and D (Eogan 1984, 268, fig. 95.1638-43, and 300, fig. 113.3252-3281), Co. Meath. Completely undecorated Beakers are rare but include the Beaker from a burial at Knowth (Eogan 1984, 308-12, fig. 117, pl. 80), vessels from Knowth concentration B (Eogan 1984, 268-9, fig. 96), and several examples from Mell and Newtownbalregan 2, Co. Louth, and Kilgobbin, Co. Dublin (Roche and Grogan 2005; Grogan 2004; Grogan and Roche 2005b).

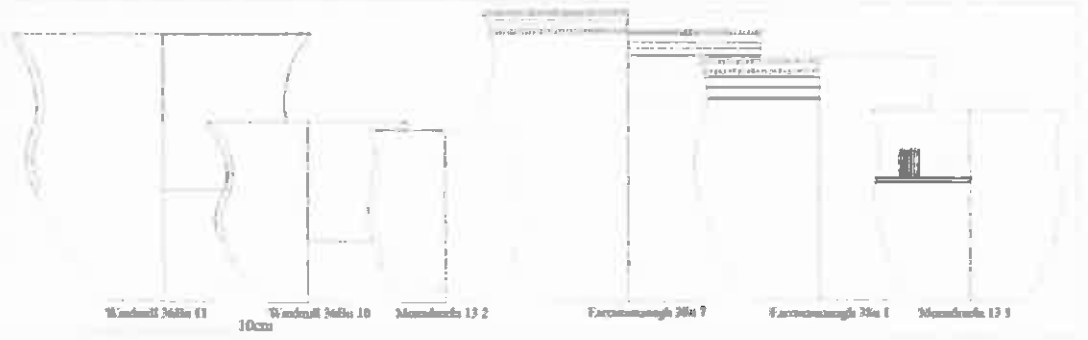

Fig. 2. Left: conjectural reconstruction of undecorated Beaker vessels from Windmill Site 36Bii and Monadreela Site 13; right: fine vessels, Farranamanagh 38ii.7 and 1, Monadreela 13.1.

Domestic Beaker

There are 17 domestic vessels in the assemblage (Monadreela 13.6pc, 7p, 8p, 9-10, 12, Windmill 36i.2, Windmill 36ii.3, 12, 13p, 14-16, 17p, 18, 19pc, Farranamanagh 39.3)(Fig. 3). The pottery is of good quality, well-finished, fabric with smooth surfaces; these vessels are generally larger than the so-called fine Beaker with thicker walls (9-11mm). As noted above, other than a slightly greater incidence of shale there is no substantial difference in the inclusions in this fabric. Domestic and fine Beaker occur together at Mell, Kilgobbin, Newgrange, Knowth and several sites at Lough Gur.

The N8 material includes six undecorated vessels two of which, Monadreela 13.6 and Windmill 36Bii.19, have single applied horizontal cordons just beneath the rim. These are similar to, but heavier than, the fine cordoned Beakers. There are two tub-like vessels with elongated and

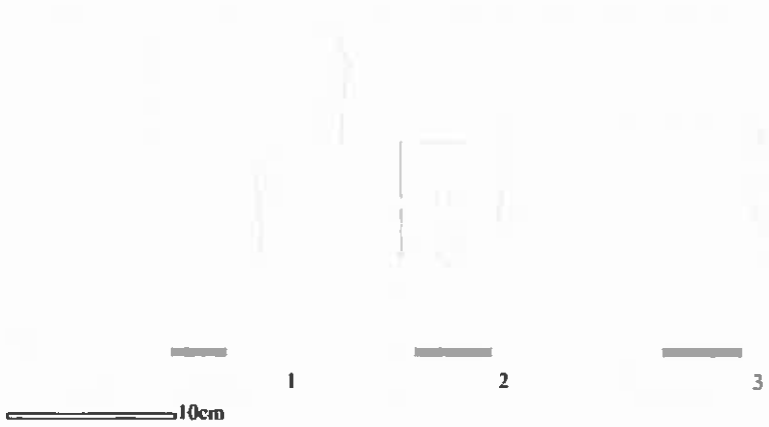

Fig. 3. Conjectural reconstruction of domestic Beaker vessels from Monadreela Site 13 (1. Vessel 8) and Windmill Site 36Bii (2. Vessel 14), and Early Bronze Age domestic pot from Hughes'-Lot-East (3. Vessel 1).

inverted rims and tall upright necks (Fig. 3; Monadreela 13.8, Windmill 36ii.14). This is an unusual form but can be paralleled by vessels from Lough Gur Circle L (Grogan and Eogan 1897, 418, fig. 53.2173-4). Monadreela 13.9 has multiple applied heavy cordons on the upper part of the vessels with alternating rows of oblique elongated stab marks; the lower part of the vessel has horizontal rows of fingernail impressions. This is a widely distributed form (distinctive enough to be classified as 'Rockbarton pots' by Case (1961)) that occurs at Kilgobbin (Grogan 2004a; Fig. 4) and Site 5 at Dalkey Island (Liversage 1968, 72, pl. 7.p54; diameter *c.* 27cm), Knowth (Eogan 1984, 305, fig. 116.3728), Lough Gur Site D (Ó Ríordáin 1954, 379, fig. 38.1), and Rockbarton hearth II, Co. Limerick (Mitchell and Ó Ríordáin 1942, 264, fig. 6. II.I).

Other vessel forms include those with soft, S-shaped, profiles (Windmill 36Bii.16), closed barrel- or tub shaped pots (Windmill 36Bii.15 and 17). The most common decorative treatment consists of lines of finger- or thumbnail impressions (Monadreela 13.9, 12, Windmill 36Bii.19), or oppose pairs, formed by the thumb and forefinger, in rows (Windmill 36Bii.14-6, 18). Elongated stab-and-drag impressions occur on Windmill 36Bii.12 while Windmill 36i.3 has apparently randomly applied birdbone impressions. Monadreela 13.10, which had been burnt after breakage, has a loose lattice of deeply scored lines.

Discussion

The occurrence of nine new Beaker assemblages is a very important addition to our understanding of the final Neolithic/early Bronze Age and particularly in an area that has not previously produced pottery of this type. The closest Beaker site is Longstone Cullen, Co. Tipperary, while Lough Gur and Doonmoon are further to the west and south in Limerick (Ó Ríordáin 1954; Grogan and Eogan 1987). Recent discoveries have extended the Beaker distribution into, for example, south Cork at sites such as Curraheen, Barnagore and Carrigohane (Danaher 2004b; 2004c; 2004d).

The presence of both fine and domestic Beaker has been widely recorded, occurring at, for example, Knowth (Eogan 1984), Newgrange (Cleary 1983), and Monknewtown (Sweetman 1976), Co. Meath, Dalkey Island, Co. Dublin (Liversage 1968), Doonmoon (Gowen 1988, 52-61), and several excavations at Lough Gur, Co. Limerick, including Sites C, D and K (Ó Ríordáin 1954; Grogan and Eogan 1987). Fine vessels of the type found on the N8 Cashel Bypass have generally been assigned to Clarke's European Bell Beaker, or his Wessex/Middle Rhine types (1970). More recently, following reviews by, for example, Lanting and van der Waals (1972), there has been a greater recognition of the regional development of Beaker. Case's (1993) simpler threefold scheme, and its specific application to the Irish material, provides a straightforward medium for insular comparison (Case 1995). The N8 Cashel Bypass material, with its classic Bell Beaker profile, and simple horizontally arranged zonal ornament, conforms to his style 2 and is dated to *c.* 2450-2200 BC.

Fig. 4. Large cordoned domestic Beaker from Kilgobbin, Co. Dublin.

The early Bronze Age

Two sites produced small quantities of food vessel pottery (Tables 1 and 3). At Site 30, Owen's and Bigg's Lot, there were a few sherds and crumbs of much worn pottery that are probably from a bowl while a rimsherd from a fine vase came from a pit at Windmill Site 34. Little can be deduced from such poorly preserved material but there is very little of this pottery in south Tipperary; a few burials are recorded (Waddell 1990, 133-5) and there is a small cluster to the west around Emly.

Conclusions

The sites on the N8 Cashel Bypass demonstrate intensive and prolonged prehistoric activity in a concentrated area; the early Neolithic, Beaker and Bronze Age material are the first discoveries of these ceramic types in the vicinity and provide evidence for long term settlement development leading to the emergence of Cashel as a significant regional focus in later prehistory.

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CATALOGUE

Where the pottery is listed in the catalogue the context numbers are in bold: *e.g.* bodysherds: **92**.5-6. Numbers in square brackets (*e.g.* **92**.[16-7]) indicate that the sherds are conjoined.
R = Rimsherd N = Neck-sherd B = Body-sherd S = shoulder-sherd f = fragment
The thickness refers to an average dimension; where relevant a thickness range is indicated. Vessel numbers have been allocated to pottery where some estimation of the form of the pot is possible, or where the detailed evidence of featured sherds (*e.g.* rims, shoulders), fabric or decorative treatment indicates separate vessels.

The Chalcolithic (Copper Age) Beaker pottery

MONADREELA (03E0378), SITE 13

The excavation number 03E0378 is omitted throughout; only the context number, abbreviated to the final two digits (*e.g.* **85** for 13085), followed by the find number is included.

Pit [83]

The primary fill **[85]** of pit **[83]** produced a single small neck sherd (**85**:213) from a fine vessel of dark red-brown fabric with a medium content of quartzite inclusions (≤ 0.2mm); neck thickness: 4.93mm; weight: 0.25g.
An assemblage of 147 sherds of final Neolithic/early Bronze Age Beaker came from the fills of two pits ([**85**], [**99**]). This material (15 rim-, 36 neck-, 76 body, 20 base/base-angelsherds; 14 fragments; 141 crumbs) weighed 1,831.2g and represented six fine vessels (Nos 1–5, 11) and six domestic pots (Nos 6–10, 12).

Fill **[85]** produced 122 sherds (15 rim-, 31 neck-, 60 body, 16 base/base/angle-sherds; 11 fragments; 109 crumbs) from at least 10 Beakers (total weight of sherds: 1,722g).
Vessel 1 (Fig. 2). This is represented by 6 worn sherds (2 neck sherds: **85**.1–2; 3 body-sherds: **85**.4–6) from a vessel with an upright, gently curved, neck and a gently rounded belly giving it a soft S-shaped profile. The red-buff fabric has a grey-buff internal surface and a dark grey core. There is a medium content of finely crushed quartzite inclusions (≤ 1mm, very occasionally up to 2 x 1mm). Thickness: 5mm.
Decoration A band of 3 slightly horizontal lines, possibly of comb, with, beneath, panels of lightly off-vertical comb impressed lines alternating with blank panels. Beneath is a slight cordon flanked by horizontal lines of comb.

Vessel 2 (Fig. 2). This small plain vessel is represented by 7 sherds (1 rimsherd: **85**.8; 1 base/angle-sherd: **85**.9; 2 neck/belly-sherds: **85**.[12–3]; 3 body-sherds: **85**.10–1, 14). There is a rounded, slightly thickened rim, curved neck and rounded belly narrowing to a rounded, un-footed, base giving the vessel a soft S-shaped profile. The red-buff to dark red-grey fabric has a dark grey core: the surfaces are slightly pitted. There is a low content of quartzite, sandstone and grog inclusions (up to 5 x 4mm).
Dimensions
Maximum external rim diameter: 9.80mm Maximum internal base diameter: 6.40mm

Height: *c.* 108mm Neck thickness: 4–4.5mm; body: 4.2mm Weight: 275g

Vessel 3. This is represented by a single curved neck sherd (**85**.7) from a medium sized plain fine vessel of buff-brown fabric. There is a medium content of very finely crushed quartzite and grog inclusions (≤ 1mm, occasionally up to 5 x 4mm). The external surface appears to have been burnished. Thickness: 4mm.

Vessel 4. There are 4 rimsherds (**85**.[15–7], 18) from a medium vessel with a rounded rim and a high curved neck. The fine, very smooth, compact red-brown fabric has a dark grey core. There is a low content of fine quartzite inclusions with some larger pieces of shale (up to 5 x 4mm) and grog. Internal decoration consists of 4 evenly spaced horizontal ridges.
Maximum external rim diameter: 142mm
Vessel 5. This is represented by 7 sherds (2 rimsherds: **85**.24, 28; 1 neck sherd: **85**.25; 4 body-sherds: **85**.26–7, 86–7) from a medium vessel with a rounded to slightly flat-topped and everted rim and a short curved neck; there is a low, pinched-up, horizontal cordon in the neck. The fine, smooth, red to brown-buff fabric has a grey core with some surface pitting. There is a low to medium content of crushed quartzite and grog inclusions. Neck thickness: 5.8mm. Weight: 20g.
Maximum external rim diameter: *c.* 135mm

Other sherds
85.79–80 are base/angle-sherds from a rounded, un-footed, base that splays out into a rounded body. The buff to cream-buff fabric has a buff to grey-buff core. The fabric is smooth but with some pitting and internal cavities. There is a low to medium content of quartzite (up to 3 x 2mm) and grog (up to 2 x 2mm). Body thickness: 8.2mm; base: 11.2mm. Maximum base diameter: 96mm; weight: 40g. From a vessel like Nos 4 and 5.

There are a further 18 sherds (5 neck sherds: **85**.98–101, **85/108**.237; 13 body-sherds: **85**.88–94, 102, 130–33, 141; 10 fragments: **85**.103–7, 134–5, **85/108**.227–8, 236; 109 crumbs **85**.107–26 (20), 136–40 (5), 142–85 (44), 191–204 (14), 207–226 (20), 229–34) that could not be ascribed to any particular vessel as well as 46 pieces of burnt clay (**85**.187–9, **85/108**.235 (42), 238).

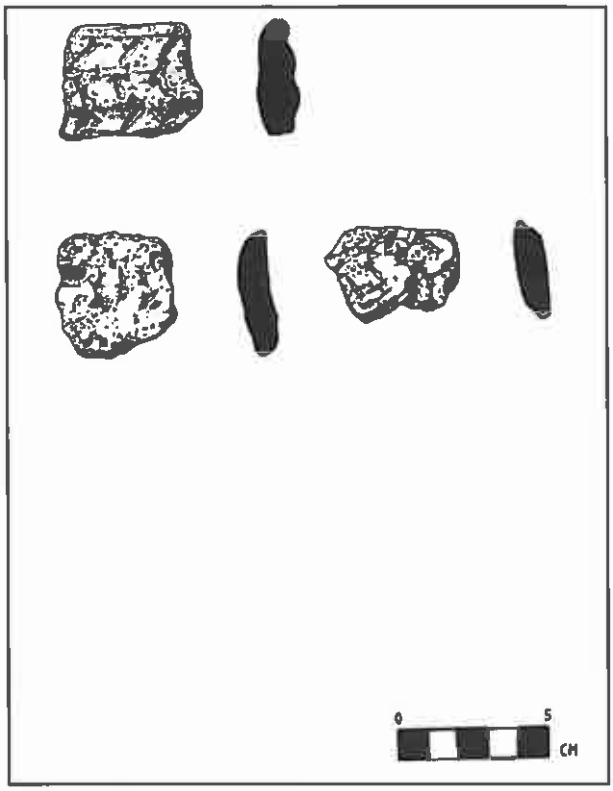
Domestic Beakers
Vessel 6. This is represented by 8 worn sherds (2 rimsherds: **85**.29–30; 2 neck sherds: **85**.25; 4 body-sherds: **85**.26–7, 86–7) from a medium vessel with a rounded rim and a short upright neck; there is a pronounced, pinched-up horizontal cordon in the neck. The buff fabric has a dark grey core and a crumbly, porous, texture with surface pitting and internal cavities. There is a medium content of shale inclusions. Weight: 70g
Maximum external rim diameter: 148mm Maximum external diameter: 160mm

Vessel 7. This is represented by a single rimsherd (**85**.23). The flat-topped rim has a slight outward expansion created when flattening the rim top; the neck is curved. The smooth, slightly pitted, buff fabric has a grey-buff core. There is a very low content of crushed sandstones (up to 2 x 2mm). Neck thickness: 8.2mm.

Vessel 8 (Fig. 3). This is represented by 43 sherds (4 rimsherds: **85**.33, [34–5], 36; 8 neck sherds: **85**.37–42, 62, 127; 21 body-sherds: **85**.[44–9], [50–1], 52–61, 72, 128–9; 10 base-/ base/angle-sherds: **85**.[63–5], 66–71, 72) from a large vessel. The round to slightly flat-topped rim is sharply inverted and there is a high curved neck: there is a sharp, pinched-out, junction between the rim and neck forming a false cordon. The lower body is deeply rounded and narrows to a flat un-footed base. The fine smooth fabric is buff to cream-, red- and dark grey-buff with a low to medium content of quartzite and shale inclusions (≤ 2 x 2mm). Neck thickness: 8.5–10.5mm; body: 8.5–9.5mm. There is a burnt accretion on the inner face of **85**.33 that indicates the vessel had been used in a domestic context. There is interesting evidence for a differential post-breakage history of the sherds. Most indicate wear but on many this is slight and there is a large number of refitting sherds. However, there are some abraded sherds, such as the perforated neck sherd **85**.39. Some sherds had been burnt, or at least were in direct contact with a fire, after breakage. These include **85**.36 and 42 as well as **85**.34

that re-fits with an unburnt sherd **85**.35. The best preserved sherds, such as **85**.36 and 65, show that the vessel originally had a very smooth, possibly burnished, outer finish.
Maximum external rim diameter: 210mm Maximum external diameter: 230mm
Maximum external base diameter: 112mm Weight: 900g

Vessel 9. This is represented by 3 sherds (1 rimsherd: **85**.74; 2 neck sherds: **85**.75a, 75b) from a large vessel with a slightly flattened rim with a slight outward projection; there is a low, pinched-up, cordon beneath with a second, more pronounced, cordon below. The vessel appears to have had a generally upright profile. The slightly porous, pitted, fabric has internal cavities; it is buff to red-buff with a grey-buff to dark grey core. There is a low content of crushed quartzite inclusions (up to 4 x 3mm). Neck thickness: 8.5–13.5mm; body: 9mm. Weight: 40g.
Decoration There are rows of oblique elongated stab marks above and below the cordons. The neck has rows of closely spaced oblique fingernail impressions and at least one finely incised horizontal line.
Maximum external rim diameter: *c*. 210mm



Appendix 10.1: Vessel 9 85.74, 85.75b & 85.75a

Vessel 10. This is represented by 4 neck/body-sherds (**85**.[76a-b], 77–8) from a large vessel of red- to grey-brown fabric that appears to have been burnt after breakage. The vessel appears to have had a soft S-shaped profile. There is a medium content of crushed quartzite inclusions (≤ 2 x 1mm) and grog (including large pieces up to 3 x 3mm). Although the inner surface is smooth it is irregular and uneven giving the vessel a very variable wall thickness. Neck thickness: 6.5–8mm; body: 6.2–8.5mm. Weight: 60g.
Decoration The lower neck and body, at least, has a loose lattice of horizontal and vertical deeply incised narrow lines.

Group I. This is represented by 4 sherds (2 body-sherds: **85**:3–4; 2 base/angle-sherds: **85**: 1–2) from a fine vessel of buff to red-buff fabric with a very low content of fine quartzite inclusions; body thickness: 7.49mm; weight: 11g. These sherds may be from Vessel 5.
Group II. This is represented by a single neck sherd (**85**:5) from a very fine vessel of light buff fabric; thickness: 4.33mm; weight: 0.2g.
Decoration A small impression on the neck may indicate that the pot was decorated.

Other sherds
Neck sherds: **85**:190, 6; body-sherds: **85**:95–97, 186, 205–06, 7–11; 1 fragment: **85**:12.
Other material
This fill also produced 76 small, shapeless, pieces of fired clay **(03E0378:226)**. These include a few larger pieces (up to 22.95 x 17.79 x 16.38mm) but most are much smaller (≤ 13.22 x 12.12 x 8.84mm). The material is thoroughly oxidised to a bright red-buff colour and it is improbable that this occurred accidently. While the clay contains some inclusions these are not evenly mixed through the fabric nor is there evidence for particular material selection; the clay does not, therefore, appear to be waste from pottery production nor do the shapes indicate that this formed lining material or daub. Total weight: 48g.

Pit [86]
The secondary fill [**99**] of this pit produced 25 sherds (5 neck-, 16 body, 4 base/base-angelsherds; 3 fragments; 32 crumbs) from at least two Beakers (total weight: 120g).

Vessel 11. This is represented by 10 sherds (4 neck sherds: **99**.1–2, [3–4]; 6 body-sherds: **99**.5–10) from a small plain fine vessel of smooth red-buff fabric with a dark grey core. Neck thickness: 4.5mm; body: 4.5–5.5mm.

Other sherds
99.19 is a worn neck sherd of red-buff fabric with a dark grey core and a low content of quartzite inclusions. The pit also produced 5 worn body-sherds (**99**.20–4), 3 fragments (**99**.25–7) and 32 crumbs (**99**.28–59) as well as a lump of burnt earth (**99**.60).

Vessel 12. This domestic Beaker is represented by 9 sherds (4 base/angle-sherds: **99**.[11–13], 16; 5 body-sherds: **99**.[14–5], 17–8, 61) from the lower part of a medium vessel with a slightly concave un-footed base. The smooth red-buff fabric has a low content of crushed quartzite and grog inclusions (up to 4 x 3mm). Body thickness: 7–9mm.
Decoration consists of apparently randomly applied fingernail impressions.
Maximum external base diameter: 86mm

Site	Vessel	Context/feature	No. of sherds	Rim	Base-, baseangle, shoulder	Neck	Body	Frags	Crumbs	Inclusions	Vessel size	Burnished	Decorated	Pottery type
Ballyknock (1l)	1	243	2	0	1	1	0	0	0	Q	-	-	-	ENCB
Ballyknock (1l)	2	115	1	0	1	0	0	0	0	Q M	-	-	-	ENCB
Ballyknock (1l)	3	306	1	0	0	1	0	0	0	Q M	-	-	-	ENCB
Ballyknock (1l)	4	119	2	0	1	0	1	0	0	Q	-	-	-	ENCB
Ballyknock (1l)	Other	243	2	0	0	0	2	0	0	Q	-	-	-	ENCB
Ballyknock (1l))	Total	243	8	0	3	2	3	0	0	Q	-	-	-	ENCB
Monadreela (7)	1	32	9	1	2	3	3	0	0	Q	Me	?	-	ENCB
Monadreela (9)	1	46	5	0	2	4	0	0	0	Q	Me	-	-	ENCB
Monadreela (9)	2	46	2	0	0	2	0	0	0	Q	-	-	-	ENCB
Monadreela (9)	Other	46	2	0	0	1	0	2	0	-	-	-	-	ENCB
Monadreela (13)	1	85	1	0	0	1	0	0	0	Q	-	-	-	ENCB
Monadreela (13)	1	85	6	0	0	2	4	0	0	Q	Me	-	✓	B
Monadreela (13)	2	85	7	1	2	4	0	0	0	Q S G	98	-	-	PB
Monadreela (13)	3	85	1	0	0	1	0	0	0	Q G	Me	✓	-	PB
Monadreela (13)	4	85	4	4	0	0	0	0	0	Q Sh G	142	-	✓	B
Monadreela (13)	5	85	7	2	0	1	4	0	0	Q G	135	-	C	PB

Monadreela (13)	Other	85	20	0	2	5	13	10	109					B
Monadreela (13)	6	85	8	2	0	2	4	0	0	Sh	148	-	-	PDB
Monadreela (13)	7	85	1	1	0	0	0	0	0	S	Me	-	-	PDB
Monadreela (13)	8	85	43	4	10	8	21	0	0	Q Sh	210	✓	-	PDB
Monadreela (13)	9	85	3	1	0	2	0	0	0	Q	210	-	✓	DB
Monadreela (13)	10	85	4	0	0	3	1	0	0	G Q	L	-	✓	DB
Monadreela (13)	Gp I	85	4	0	2	0	2	0	0	Q	-	-	✓?	B
Monadreela (13)	Gp II	85	1	0	0	2	0	0	0	-	-	-		B
Monadreela (13)	Other	85	13	0	0	2	11	1	0	-	-	-		B
			122	15	6	31	60	11	109					
Monadreela (13)	11	99	10	0	0	4	6	0	0	Q S Sh	190	-	-	PB
Monadreela (13)	12	99	9	0	4	0	5	0	0	Q G	Me	-	✓	DB
Monadreela (13)	Other	99	6	0	0	1	5	3	32			-	-	B
			25	0	4	5	16	3	32					
Monadreela (13)	Total		147	15	20	36	76	14	141					
Boscabell (18)	1	196	1	0	0	1	0	0	0	Sh	-	-	✓	B
Boscabell (18)	2	100	8	0	8	0	0	0	0	S	Me	-	?	B
Boscabell (19)	1	122	6	0	2	4	0	0	0	Q Sh	M	-	-	ENCB
Boscabell (20)	1	4	2	0	0	0	2	0	0	Q	Me	-	✓	B
Boscabell (20)	2	161	1	0	0	0	1	0	0	S	-	-	✓	B
Boscabell (20)	Other	122	1	0	0	1	0	0	0	-	-	-	-	B
George's-Land (22)	Other	508	2	0	0	1	1	0	0		Sm	-	✓	B
Hughes' Lot East (25iil)	1	106	15	3	0	2	10	0	0	D	L	-	-	EBA
Hughes' Lot East (25lll)	2	106	1	0	0	0	1	0	0	Q	-	-	-	EBA
Hughes' Lot East (25lli)	3	106	3	0	2	0	1	0	0	Q Sh	-	-	-	EBA
Hughes' Lot East (25lii)	Other	106	0	0	0	0	0	10	15	-	-	-	-	EBA
Hughes' Lot East (25lll)	Other	106	3	0	0	0	3	0	0	-	-	-	-	EBA
Hughes' Lot East (25lll)	Total	106	22	3	2	2	15	10	15					EBA
Hughes' Lot East (25lll)	Total		0	0	0	0	0	1	0					B
Owen's and Bigg's Lot (30)		10	3	1	0	0	2	2	12					BFV
Windmill (34)	1	7	1	1	0	0	0	0	0	-	-	-	✓	VFV
Windmill (36l)	1	580	4	2	0	2	0	0	0	Q Sh	-	-	✓	B
Windmill (36l)	2	580	3	0	0	3	0	0	2	Q	-	-	-	PB
Windmill (36l)	3	580	2	0	0	2	0	1	0	Q Sh F	-	-	✓	DB
Windmill (36l)	4	551	1	0	1	0	0	0	0	Q D	-	-	?	B
Windmill (36l)	Other	551	1	0	0	0	1	0	0	Q	-	-	?	B
Windmill (36l)	Other	550	0	0	0	0	0	1	0					B
Windmill (36l)	Total		11	2	1	7	1	2	2	Q Sh	-	-	✓	B
Windmill (36)		79	3	0	0	3	0	0	0	Q Sh	-	-	?	B
Windmill (36li)	1	640	11	1	4	3	3	0	0	S G	186	✓	✓	B
Windmill (36ii)	2	640	7	2	0	3	2	0	0	Q	190	✓	✓	B
Windmill (36ii)	3	640	1	1	0	0	0	0	0	Q	160	-	✓	B
Windmill (36ll)	4	640	1	1	0	0	0	0	0	Q	200	-	✓	B
Windmill (36ll)	5	640	24	0	0	16	8	0	16	Q	170	-	✓	B
Windmill (36ll)	6	640	13	0	0	6	7	0	0	Q	175	-	✓	B
Windmill (36li)	7	640	4	0	0	4	0	0	0	Q	Me	-	✓	B
Windmill (36li)	8	640	1	1	0	0	0	0	0	Q	Me	-	✓	B

Windmill (36il)	9	640	1	0	0	1	0	0	0	Q	-	-	✓	B
Windmill (36ii)	Other	640	3	0	0	2	1	0	0	Q	-	-	✓	B
Windmill (36li)	10	640	15	5	0	2	8	0	0	Q S	128	-	-	PB
Windmill (36li)	11	640	26	7	0	3	16	0	0	Q S Sh	190	✓	-	PB
Windmill (36li)	12	640	9	0	0	6	3	0	0	Q	M	-	✓	DB
Windmill (36il)	Other	640	7	2	0	3	2	0	0		-	-	✓	DB
Windmill (36ii)	13	640	17	2	0	2	13	0	0		175	-	-	PDB
Windmill (36il)	14	640	1	1	0	0	0	0	0	Q Sh	175	-	✓	DB
Windmill (36il)	15	640	1	1	0	0	0	0	0	G Q	L	-	✓	DB
Windmill (36ll)	16	640	29	1	0	5	23	0	0	G Sh Q	L	-	✓	DB
Windmill (36li)	Other	640	32	0	0	5	27	13	0					DB
Windmill (36li)	17	640	1	1	0	0	0	0	0	Q	170	-	?	DB
Windmill (36li)	18	640	2	0	0	2	0	0	0	Q	M	-	✓	DB
Windmill (36li)	19	640	2	0	0	2	0	0	0	Q G S	M	-	✓	DB
Windmill (36il)	Other	640	50	0	12	1	37	44	0			-	✓	B/DB
Windmill (36ii)	Total	640	258	26	16	66	150	57	16					
Windmill (36il)	20	480	2	2	0	0	0	0	0	Q	130	-	-	PB
Windmill (36ll)	21	480	1	0	0	1	0	0	0	Q	-	-	✓	B
Windmill (36il)	22	407	8	0	1	0	7	0	0	Q	M	-	-	PB
Windmill (36il)	23	407	7	0	0	1	6	0	0	G	-	-	-	PB
Windmill (36ll)	24	407	2	1	0	1	0	0	0	G	-	-	-	PB
Windmill (36ll)	25	407	1	0	0	0	1	0	0	Q S D	-	-	✓	B
Windmill (36ll)	26	407	1	0	0	0	1	0	0	Q S	-	-	✓	B
Windmill (36ii)	Other	407	7	0	0	0	7	0	0	-	-	-	-	B
	Total	407	26	1	1	2	22	0	0					
Windmill (36ll)	Other	620	6	0	0	0	6	0	1					B
Windmill (36ll)	27	620	44	1	2	21	20	23	0	Q S Sh	L	-	✓	B/DB
Windmill (36ll)	Other	805	1	0	0	1	0	0	0				-	B
Windmill (36li)	Other	482/12	1	0	0	0	1	2	4					
Windmill (36ii)	Total	ALL	339	30	19	91	199	82	21					
Farranamanagh (38)	1	753	23	5	6	5	7	0	0	Q F	160	-	✓	B
Farranamanagh (38)	2	753	1	1	0	0	0	0	0	Q F	Me	-	✓	B
Farranamanagh (38)	3	753	1	1	0	0	0	0	0	Q	-	-	✓	B
Farranamanagh (38)	4	753	2	0	0	2	0	0	0	Q S G?	Me	?	✓	B
Farranamanagh (38)	5	753	2	0	0	2	0	0	0	Q G	Me	-	?	B
Farranamanagh (38)	6	753	1	0	0	0	1	0	0	Q G	Me	-	✓	B
Farranamanagh (38)	Other	753	10	0	0	10	0	28	27					B
Farranamanagh (38)	7	630	1	1	0	0	0	0	0	Q	200	-	✓	B
Farranamanagh (38)	8	630	1	0	1	0	0	0	0	Q	Sm	-	?	B
Farranamanagh (38)	Other	630	2	0	0	0	2	4	0	-	-	-	-	B
Farranamanagh (38)	Other	701	8	0	0	1	7	5	0					B
Farranamanagh (38)	Total		52	8	7	20	17	37	27					
Farranamanagh (39)	1	39	2	0	0	0	2	0	3	Q	Me	-	✓	B
Farranamanagh (39)	2	25	23	0	0	0	23	0	0	Q	-	-	✓	B

Farranamanagh (39)	3	25	3	0	0	0	3	0	0	Q	L	-	C	DB
Farranamanagh (39)	Other	25	14	2	0	3	9	25	58					B
Farranamanagh (39)	Other	25	0	0	0	0	0	0	70					B
Farranamanagh (39)	Total		42	2	0	3	37	25	131					

B = Beaker PB = Plain Beaker DB = Domestic Beaker PDB = Plain Domestic Beaker
B/VFV = Bowl/Vase food vessel ENCB = Early Neolithic Carinated Bowl
Q = Quartzite G = Grog Sh = Shale S = Sandstone
Table 3. The prehistoric pottery from the N8 Cashel Bypass.

Site	Vessel	Context	Sherds to draw	Sherds to section only	Photograph	Decorated
Monadreela (9)	1	46	N-S. 46.1, 6			
Monadreela (13)	1	85	N. 85.1, 6			✓
Monadreela (13)	2	85	Reconstruction in report			-
Monadreela (13)	4	85	R. 85.[15-7]		✓	✓
Monadreela (13)	5	85		R. 85.24		-
Monadreela (13)	6	85	R. 85.[29a-b]			-
Monadreela (13)	7	85		R. 85.23		-
Monadreela (13)	8	85	Reconstruction in report			-
Monadreela (13)	9	85	R. 85.74, N. 85.75a-b, Reconstruction in report		✓	✓
Monadreela (13)	10	85	N/B. 85.[76a-b], 77-8			✓
Monadreela (13)	12	85		B-A. 85.[11-3]		
Boscabell (19)	1	122		N-S. 122.[1-6]		
Boscabell (20)	1	4	B. 4.[1-2]			✓
Boscabell (20)	2	161	B. 161.1			✓
Windmill (36ii)	1	640	R. 640.69, Reconstruction in report			✓
Windmill (36ii)	2	640	R. 640.69, Reconstruction in report			✓
Windmill (36ii)	3	640	R. 640.[19-20]			✓
Windmill (36ii)	4	640	R. 640.21			✓
Windmill (36ii)	5	640	R. 640.148			✓
Windmill (36ii)	6	640	R. 640.53, B. 85.[59-60]			✓
Windmill (36ii)	8	640	R. 640.69			✓
Windmill (36ii)	9	640	N. 640.70			✓
Windmill (36ii)	13	640	R/N. 640.[131-4]			✓
Windmill (36ii)	14	640	R. 640.148			✓
Windmill (36ii)	15	640	R. 640.149			✓
Windmill (36ii)	16	640	R: 640.150, N. 640.[151-2]			✓
Windmill (36ii)	27	620	R: 620.[1a-b], N/B. 620.[14-5, 33-5]	B-A. 620.[23-4]		✓
Farranamanagh (38)	1	753	R. 753.[1-5]	B-A. 753.22		✓

Table 4. Pottery proposed for illustration

App. 10.2: Excavation of pits [83] & [86] at west baulk, facing west

App. 10.3: Vessel 1

App. 10.4: Vessel 4

App. 10.5: Vessel 4 reverse

App. 10.6: Vessel 6

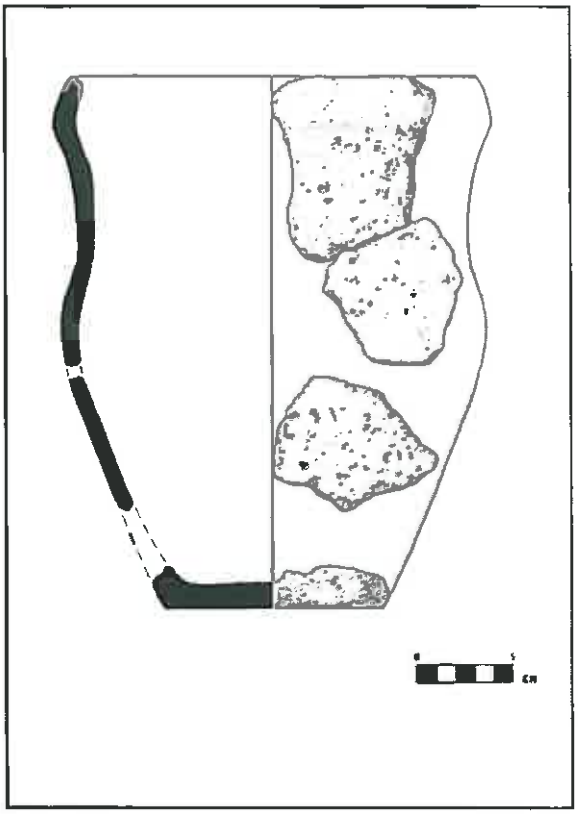
App. 10.7: Profile of Vessel 6, showing inclusions

App. 10.8: Vessel 8

App. 10.9: Profile of Vessel 8, showing inclusions

App. 10.10: Vessel 8

App. 10.11: Vessel 8



App. 10.12: Vessel 8 85.35, 85.37, 85.44 & 85.69

App. 10.13: Vessel 9

App. 10.14: Profile of Vessel 9, showing inclusions

App. 10.15: Profile of Vessel 9

App. 10.16: Vessel 10 including two refitting sherds

Appendix 11 Post Medieval Pottery Report

The post-medieval pottery

from

Site 13: Monadreela (03E0378)

N8 by-pass and the N74 link road, Cashel, Co. Tipperary

Clare McCutcheon MA MIAI

Introduction:

A total of three sherds of pottery were presented for study. All three date to the later 19th-20th century.

Methodology:

The material has been identified visually and the information has been entered on an Access database as per the requirements of the National Museum of Ireland. The pottery identification is presented in Table 1 showing the quantity of sherds in each fabric type and the minimum number of vessels (MNV), an objective number based on the presence of rim/hanMiddle sherds in the assemblage. The more subjective minimum number of vessels represented (MVR) is also listed and is based on the numbers of diagnostic pieces such as differently shaped rims, quantity of hanMiddle etc. The most likely form of the vessels represented by the sherds and the known date of distribution of the fabric type are included in the table.

Fabric	Sherds	MNV	MVR	Form	Date
Pearlware	1	-	1	Bowl	19th
Transfer printed ware	1	-	1	Plate	19th
Stoneware	1	-	1	Bottle	19th-20th
Total	**3**	**-**	**3**		

Table 1: Pottery identification, Site 13: Monadreela (03E0378)

Pearlware:

Wedgwood's development of creamware was further refined as pearlware, with a harder-fired clay and a blue rather than a green tinge in the collected glaze (Savage & Newman 2000, 216). This formed the basis for many decorative forms of the later 18th and 19th centuries such as shell-edged, mochaware, transfer printed and banded wares. Some items were decorated with free-hand painting, often rather crudely drawn.

Transfer printed ware:

Transfer printing is commonly associated with the so-called 'Willow pattern', but the variety of patterns is wide with landscapes, particularly English and Italianate very popular as well as many varieties of Chinese style or Chinoiserie. While the principal colour used is a deep blue, decoration also comes in red, grey, brown, purple, green and black. The decoration consists of the application of a coloured tissue paper design.

Stoneware:

The term is used here to cover all English stonewares, made of a clay and fusible stone, which can be fired to partial vitrification, not then requiring a glaze to make it impervious to liquids (Savage & Newman 2000, 275).

Bibliography:

Savage, G. & Newman, H. 2000 *An illustrated dictionary of ceramics*. London. Reprint 1985 edn.

Appendix 12 Burnt Bone Report

SITE 13,

MONADREELA,

N8 CASHEL BY-PASS & N74 LINK ROAD

LICENCE No. 03E0378

DIRECTORS: JOANNE HUGHES AND ROS MACLEOD

BURNT BONE REPORT

BY LAUREEN BUCKLEY

INTRODUCTION

Excavations at this site were carried out by Joanne Hughes for Judith Carroll Network Archaeology Ltd., on behalf of South Tipperary County Council prior to construction of the N8 Cashel Bypass and N74 link road. During investigations a pit containing burnt bone, a flint, a stone axe, a layer of charred hazelnuts and acorns as well as sherds of Bronze Age pottery was found. A series of post holes and pits were identified and there were also post-medieval ditches found (Hughes and Macleod, 2003).

METHODS

Bone consists of an organic and an inorganic part. When it is placed in fire the organic part undergoes dehydration and an oxidation reaction occurs. Depending on the temperature and how long the bone has been in the fire, the reaction may be complete or incomplete. A complete or efficient burning of bone or deliberate cremation of bone is one in which all the organic content is burnt off and only the inorganic part of the bone remains. The inorganic part generally re-crystallizes to form a more stable structure and so fully cremated remains survive for millennia in a well preserved condition.

Examination of burnt or cremated remains involves a description of colour and texture of the bone as this helps determine the efficiency of the cremation. Efficiently cremated bone is white in colour and usually has a chalky texture. Less well cremated bone, where the temperature of the pyre was not high enough or where oxygen flow was restricted, or where the body was not burning for long enough, has a blue or a blue/black colour.

The bone fragments are then graded by size in order to determine the degree of fragmentation. Although fragmentation of the bone occurs continuously post-deposition, due to compression pressures and also during the disturbance of excavation and processing, it is still possible to assess whether or not the bones were deliberately crushed as part of a cremation ritual. A high proportion of relatively large fragments would suggest that the bones were not deliberately crushed after the cremation whereas a small deposit of relatively small fragments could indicate a ritually crushed token deposit. However there are other factors to bring into account such as post-depositional disturbance; how the remains were discovered; treatment of the remains during the excavation, processing and post-excavation stages. Even storage of the material may affect the fragmentation.

The process of grading the bone involves removing the obvious very large fragments and passing the remainder through a series of sieves. The bone from each sieving is stored separately and the fragments weighed. The weight of bone in each sample is used to determine the proportion of the various fragment sizes. The categories of fragment sizes used have been arbitrarily assigned to give the lay reader an impression of how crushed or not crushed the cremation was. The fragment sizes generally used are: less than 10mm; 10-15 mm; 15-25 mm; 25-40 mm and greater than 40mm. The overlap between the groups is deliberate as it would not be possible to be exact about the size of every fragment.

Each fragment of bone is then examined and identified if possible. Animal bone is separated from human bone. The degree of identification of fragments is generally dependent on fragment size. Larger fragments are usually easier to identify although phalanges often are found intact among the smaller fragments. Successful identification depends on the number of distinguishing features present on the bone fragments as well as knowledge of the thickness and expected cross section of particular bones. However bones shrink and warp during the cremation process and sometimes it is not possible to specifically identify long bone fragments. Bones of the skull especially the petrous portions of the temporal bones, are easily identifiable and are therefore extremely useful in determining the minimum number of individuals and in distinguishing juveniles from adults.

The minimum number of individuals present can then be determined by the numbers of specific skeletal elements. It is possible to distinguish juveniles from adults from the thickness of the bone fragments, the presence or not of unfused epiphyses and by the fragmentation of the teeth. Adult teeth crowns tend to shatter during the cremation process but unerupted juvenile teeth tend to survive intact as they are protected by the jaw bones. It is usually possible to age juveniles if enough teeth are present.

RESULTS

Two pits [83] and [85] contained artefacts and remains that dated to the Bronze Age were found in the western-most part of the site (Hughes and Macleod *ibid*).

Pit [83] contained 254 sherds of Bronze Age pottery, closely associated with crushed cremated bone in the lower fill (85), as well as a broken polished stone axe. The total amount of bone recovered was 15.3g, which is too small to represent a cremation. The bone was

mainly white and chalky indicating that it had been fully cremated with just a small proportion (7.8%) was partially blue in colour where the organic part of the bone had not been fully burnt off. The bone was highly crushed, making identification difficult but the larger fragments were identified as animal bone. As the bone was associated with charred hazelnuts and acorns it seems that this pit may represent a cooking area or it may be a rubbish pit.

Pit [86] contained at least two fills, with the primary fill (99) containing 29 sherds of prehistoric pottery and two small retouched pieces of flint. There was no burnt bone from this pit.

DISCUSSION

Burnt bone was recovered from one pit on this site. It was associated with charred hazelnuts and acorns as well as a large amount of Bronze Age pottery sherds and a broken stone axe. The sample size was very small and it was identified as animal bone. It is more than likely that this is a rubbish pit associated with a cooking area. These pits are commonly found on prehistoric sites.

REFERENCES

Hughes, J., and MacLeod, R. (2003) 'Preliminary Report, Site 13' for JCNA Archaeology Ltd.

INVENTORY OF SAMPLES

Pit [83]

There were four bags of burnt bone recovered from this pit. The individual samples are described below but they are summarised here.

The total amount of bone recovered was 15.3g. The bone was mainly white in colour with a chalky texture but 1.2g (7.8%) was partially blue or grey in colour where the organic part of the bone had not been fully burnt off. The largest fragment was 24mm in length and the fragmentation of the sample is given below:

FRAGMENT SIZE	WEIGHT (g)	PERCENTAGE BY
< 10	6.6	43.1
10-15	4.5	29.4
15-24	4.2	27.5
TOTAL	15.3	100

It can be seen that nearly half the sample consisted of very small fragments, less than 10mm in length, with nearly three-quarters of the sample consisting of small fragments less than 15mm in length. The high degree of crushing of the sample made identification difficult.
Some of the larger fragments were identified and they appeared to be animal bone, including animal ribs.

INDIVIDUAL SAMPLES

Bag 1 Sample 563 Cut [083] Fill (085)

This sample consisted of 0.4g of chalk. There was no cremated bone present in the sample.

Bag 2 Sample 563 Cut [083] Fill (085)

This sample consisted of 8.7g of cremated bone. The bone was mainly white in colour with a chalky texture indicating that it had been fully burnt. However a tiny amount (0.2g) was partially blue/black in colour indicating that some of the organic part of the bone still remained. The largest fragment was 24mm in length and the fragmentation of the sample is given below:

FRAGMENT SIZE (mm)	WEIGHT (g)
< 10	2.0
10-15	2.5
15-24	4.2
TOTAL	8.7

Although some of the smaller fragments could not be identified most of the larger fragments were identified as animal bone, and appeared to be rib bone. It is likely that the entire sample was animal bone.

Bag 3 Sample 563 Cut [083] Fill (085)

This sample consisted of 0.5g of cremated bone. The bone was very white in colour with a chalky texture. The largest fragment was 11mm in length but most of the sample (0.3g) consisted of small fragments less than 10mm in length. Some of the fragments were very weathered with most of the outer cortex of the bone removed thus making identification difficult. However it did not appear to be human bone.

Bag 4 Sample 563 Cut (083) Fill (085)

This sample consisted of 6.1g of burnt bone. Most of the bone was all white with a chalky texture but 0.7g were grey/blue in colour where the organic part had not been fully burnt off. The largest fragment was 14mm in length but most of the sample (4.3g) consisted of small fragments less than 10mm in length. The remaining 1.8g consisted of fragments between 10-14mm.

All the bone was identified as animal bone.

Appendix 13 Small Finds Report

by Richard O'Brien, MA MIAI

The following objects were retrieved from sieving the retents from fill (85) of pit [83], Sample No. 563. Some of the pieces appear to have metal-working residues adhering to the surfaces but this could well be naturally-derived. If funding becomes available in the future these objects should be examined by a metallurgist to verify the presence or not of slag.

App.13.1: Fired clay from (85) within pit [83]

App.13.2: Fired clay from (85) within pit [83]

Appendix 14 Radiocarbon Dates

UBANo	Sample ID	^{14}C Age	±	AMS $\delta^{13}C$	F14C	±
UBA-13734	13 S3 1311	2965	26	-27.2	0.6914	0.0023
UBA-13743	19 S29 19184	920	25	-26.9	0.8918	0.0028
UBA-13755	23 S29 23315	1921	27	-25.8	0.7873	0.0026
UBA-13777	25iv S15 254154	1241	23	-26.1	0.8568	0.0024

Graham Hull TVAS
TVAS (Ireland) Ltd
Ahish
Ballinruan
Crusheen, Co. Clare
Ireland
VAT No. IE6360113C

14CHRONO Centre
Queens University Belfast
42 Fitzwilliam Street
Belfast BT9 6AX
Northern Ireland

Radiocarbon Date Certificate

Laboratory Identification:	UBA-13734
Date of Measurement:	2010-05-21
Site:	N8Cashel Bypass Site13 03E0378
Sample ID:	13 S3 1311
Material Dated:	charcoal
Pretreatment:	AAA
Submitted by:	Graham Hull TVAS

^{14}C Date: 2965±26

AMS $\delta^{13}C$: -27.2

Information about radiocarbon calibration

RADIOCARBON CALIBRATION PROGRAM*
CALIB REV6.0.0

*To be used in conjunction with:
Stuiver, M., and Reimer, P.J., 1993, Radiocarbon, 35, 215-230.
Annotated results (text) - -
Export file - c14res.csv

13 S3 1311
UBA-13734
Radiocarbon Age BP 2965 +/- 26
Calibration data set: intcal09.14c # Reimer et al. 2009

% area enclosed	cal AD age ranges	relative area under probability distribution
68.3 (1 sigma)	cal BC 1258- 1232	0.260
	1218- 1188	0.318
	1181- 1155	0.257
	1146- 1130	0.165
95.4 (2 sigma)	cal BC 1299- 1112	0.986
	1099- 1087	0.011
	1063- 1059	0.003

19 S29 191
UBA-13743
Radiocarbon Age BP 920 +/- 25
Calibration data set: intcal09.14c # Reimer et al. 2009

% area enclosed	cal AD age ranges	relative area under probability distribution
68.3 (1 sigma)	cal AD 1045- 1096	0.620
	1119- 1141	0.263
	1147- 1157	0.117
95.4 (2 sigma)	cal AD 1030- 1172	1.000

23 S29 233
UBA-13755
Radiocarbon Age BP 1921 +/- 27
Calibration data set: intcal09.14c # Reimer et al. 2009

% area enclosed	cal AD age ranges	relative area under probability distribution
68.3 (1 sigma)	cal AD 57- 91	0.616
	99- 124	0.384
95.4 (2 sigma)	cal AD 19- 132	1.000

25iv S15 2
UBA-13777
Radiocarbon Age BP 1241 +/- 23
Calibration data set: intcal09.14c # Reimer et al. 2009

% area enclosed	cal AD age ranges	relative area under probability distribution
68.3 (1 sigma)	cal AD 692- 749	0.661
	764- 780	0.212
	791- 806	0.127
95.4 (2 sigma)	cal AD 686- 830	0.900
	836- 868	0.100

References for calibration datasets:
PJ Reimer, MGL Baillie, E Bard, A Bayliss, JW Beck, PG Blackwell,
C Bronk Ramsey, CE Buck, GS Burr, RL Edwards, M Friedrich, PM Grootes,
TP Guilderson, I Hajdas, TJ Heaton, AG Hogg, KA Hughen, KF Kaiser, B Kromer,
FG McCormac, SW Manning, RW Reimer, DA Richards, JR Southon, S Talamo,
CSM Turney, J van der Plicht, CE Weyhenmeyer (2009) Radiocarbon 51:1111-1150.

Comments:
* This standard deviation (error) includes a lab error multiplier.
** 1 sigma = square root of (sample std. dev.^2 + curve std. dev.^2)
** 2 sigma = 2 x square root of (sample std. dev.^2 + curve std. dev.^2)
where ^2 = quantity squared.
[ ] = calibrated range impinges on end of calibration data set
0* represents a "negative" age BP
1955* or 1960* denote influence of nuclear testing C-14

NOTE: Cal ages and ranges are rounded to the nearest year which

may be too precise in many instances. Users are advised to round results to the nearest 10 yr for samples with standard deviation in the radiocarbon age greater than 50 yr.

UBANo	Sample ID	^{14}C Age	±	AMS $\delta^{13}C$	F14C	±
UBA-13702	5 S21 5063	3428	32	-25.0	0.6527	0.0026
UBA-13729	11 S6 1105	4116	22	-20.0	0.5990	0.0016
UBA-13730	11 S11 1127	5049	22	-27.3	0.5334	0.0015
UBA-13731	11 S15 1112	3093	20	-28.0	0.6804	0.0017
UBA-13732	11 S23 11149	3042	20	-24.4	0.6848	0.0017
UBA-13735	13 S29 13072	2573	24	-23.6	0.7259	0.0022
UBA-13736	13 S37 1394	3906	37	-24.1	0.6150	0.0028
UBA-13737	13 S39 1387	3880	29	-24.0	0.6170	0.0022
UBA-13739	17 S9 17064	3364	34	-28.0	0.6578	0.0028
UBA-13740	18 S20 18107	2446	27	-23.9	0.7375	0.0025
UBA-13745	20 S3 20024	1497	18	-27.4	0.8300	0.0019
UBA-13747	20 S9 20055	2019	26	-24.7	0.7778	0.0026
UBA-13748	20 S27 20129	1048	25	-25.1	0.8776	0.0027
UBA-13749	20 S13 20155	1992	31	-24.5	0.7804	0.0030

Graham Hull TVAS
TVAS (Ireland) Ltd
Ahish
Ballinruan
Crusheen, Co. Clare
Ireland
VAT No. IE6360113C

^{14}CHRONO Centre
Queens University Belfast
42 Fitzwilliam Street
Belfast BT9 6AX
Northern Ireland

Radiocarbon Date Certificate

Laboratory Identification:	UBA-13735
Date of Measurement:	2010-06-09
Site:	N8Cashel Bypass Site13 03E0378
Sample ID:	13 S29 13072
Material Dated:	charcoal
Pretreatment:	AAA
Submitted by:	Graham Hull TVAS

^{14}C Date: 2573±24

AMS δ^{13}C: -23.6

Graham Hull TVAS
TVAS (Ireland) Ltd
Ahish
Ballinruan
Crusheen, Co. Clare
Ireland
VAT No. IE6360113C

^{14}CHRONO Centre
Queens University Belfast
42 Fitzwilliam Street
Belfast BT9 6AX
Northern Ireland

Radiocarbon Date Certificate

Laboratory Identification:	UBA-13736
Date of Measurement:	2010-06-09
Site:	N8Cashel Bypass Site13 03E0378
Sample ID:	13 S37 1394
Material Dated:	charcoal
Pretreatment:	AAA
Submitted by:	Graham Hull TVAS

^{14}C Date: 3906±37

AMS δ^{13}C: -24.1

Graham Hull TVAS
TVAS (Ireland) Ltd
Ahish
Ballinruan
Crusheen, Co. Clare
Ireland
VAT No. IE6360113C

^{14}CHRONO Centre
Queens University Belfast
42 Fitzwilliam Street
Belfast BT9 6AX
Northern Ireland

Radiocarbon Date Certificate

Laboratory Identification:	UBA-13737
Date of Measurement:	2010-06-09
Site:	N8Cashel Bypass Site13 03E0378
Sample ID:	13 S39 1387
Material Dated:	charcoal
Pretreatment:	AAA
Submitted by:	Graham Hull TVAS

^{14}C Date: 3880±29

AMS δ^{13}C: -24.0

Information about radiocarbon calibration

RADIOCARBON CALIBRATION PROGRAM*
CALIB REV6.0.0

*To be used in conjunction with:
Stuiver, M., and Reimer, P.J., 1993, Radiocarbon, 35, 215-230.
Annotated results (text) - -
Export file - c14res.csv

5 S21 5063
UBA-13702
Radiocarbon Age BP 3428 +/- 32
Calibration data set: intcal09.14c # Reimer et al. 2009

% area enclosed	cal AD age ranges	relative area under probability distribution
68.3 (1 sigma)	cal BC 1857- 1855	0.012
	1771- 1686	0.988
95.4 (2 sigma)	cal BC 1876- 1841	0.111
	1823- 1796	0.051
	1781- 1636	0.838

11 S6 1105
UBA-13729
Radiocarbon Age BP 4116 +/- 22
Calibration data set: intcal09.14c # Reimer et al. 2009

% area enclosed	cal AD age ranges	relative area under probability distribution
68.3 (1 sigma)	cal BC 2850- 2813	0.309
	2742- 2728	0.106
	2695- 2685	0.070
	2680- 2623	0.514
95.4 (2 sigma)	cal BC 2861- 2808	0.269
	2756- 2719	0.144
	2704- 2580	0.588

11 S11 112
UBA-13730
Radiocarbon Age BP 5049 +/- 22
Calibration data set: intcal09.14c # Reimer et al. 2009

% area enclosed	cal AD age ranges	relative area under probability distribution
68.3 (1 sigma)	cal BC 3937- 3861	0.833
	3811- 3797	0.167
95.4 (2 sigma)	cal BC 3945- 3789	1.000

11 S15 111
UBA-13731
Radiocarbon Age BP 3093 +/- 20
Calibration data set: intcal09.14c # Reimer et al. 2009

% area enclosed	cal AD age ranges	relative area under probability distribution
68.3 (1 sigma)	cal BC 1411- 1376	0.683
	1338- 1320	0.317
95.4 (2 sigma)	cal BC 1420- 1312	1.000

11 S23 111
UBA-13732
Radiocarbon Age BP 3042 +/- 20
Calibration data set: intcal09.14c # Reimer et al. 2009

% area enclosed	cal AD age ranges	relative area under probability distribution
68.3 (1 sigma)	cal BC 1375- 1339	0.489
	1320- 1290	0.390
	1280- 1270	0.122
95.4 (2 sigma)	cal BC 1391- 1260	1.000

13 S29 130
UBA-13735
Radiocarbon Age BP 2573 +/- 24
Calibration data set: intcal09.14c # Reimer et al. 2009

% area enclosed	cal AD age ranges	relative area under probability distribution
68.3 (1 sigma)	cal BC 796- 771	1.000

```
  95.4 (2 sigma)      cal BC 806- 754                    0.895
                             685- 668                    0.088
                             610- 598                    0.017

13 S37 139
UBA-13736
Radiocarbon Age BP   3906 +/-   37
Calibration data set: intcal09.14c                  # Reimer et al. 2009
  % area enclosed       cal AD age ranges               relative area under
                                                     probability distribution
  68.3 (1 sigma)      cal BC 2467- 2391                  0.649
                             2385- 2345                  0.351
  95.4 (2 sigma)      cal BC 2484- 2286                  0.994
                             2247- 2236                  0.006

13 S39 138
UBA-13737
Radiocarbon Age BP   3880 +/-   29
Calibration data set: intcal09.14c                  # Reimer et al. 2009
  % area enclosed       cal AD age ranges               relative area under
                                                     probability distribution
  68.3 (1 sigma)      cal BC 2456- 2418                  0.326
                             2408- 2374                  0.289
                             2368- 2336                  0.257
                             2323- 2308                  0.128
  95.4 (2 sigma)      cal BC 2467- 2286                  0.989
                             2247- 2242                  0.007
                             2239- 2236                  0.004

17 S9 1706
UBA-13739
Radiocarbon Age BP   3364 +/-   34
Calibration data set: intcal09.14c                  # Reimer et al. 2009
  % area enclosed       cal AD age ranges               relative area under
                                                     probability distribution
  68.3 (1 sigma)      cal BC 1729- 1720                  0.079
                             1691- 1616                  0.921
  95.4 (2 sigma)      cal BC 1742- 1605                  0.891
                             1586- 1535                  0.109

18 S20 181
UBA-13740
Radiocarbon Age BP   2446 +/-   27
Calibration data set: intcal09.14c                  # Reimer et al. 2009
  % area enclosed       cal AD age ranges               relative area under
                                                     probability distribution
  68.3 (1 sigma)      cal BC 734- 690                    0.280
                             662- 650                    0.071
                             545- 484                    0.380
                             465- 416                    0.269
  95.4 (2 sigma)      cal BC 752- 686                    0.257
                             667- 636                    0.090
                             622- 613                    0.012
                             595- 409                    0.640

20 S3 2002
UBA-13745
Radiocarbon Age BP   1497 +/-   18
Calibration data set: intcal09.14c                  # Reimer et al. 2009
  % area enclosed       cal AD age ranges               relative area under
                                                     probability distribution
  68.3 (1 sigma)      cal AD 557- 595                    1.000
  95.4 (2 sigma)      cal AD 541- 609                    1.000

20 S9 2005
UBA-13747
Radiocarbon Age BP   2019 +/-   26
Calibration data set: intcal09.14c                  # Reimer et al. 2009
  % area enclosed       cal AD age ranges               relative area under
                                                     probability distribution
  68.3 (1 sigma)      cal BC 46- cal AD 7                0.927
                     cal AD 11- 17                       0.073
  95.4 (2 sigma)      cal BC 92- 67                      0.061
                             62- cal AD 54               0.939
```

20 S27 201
UBA-13748
Radiocarbon Age BP 1048 +/- 25
Calibration data set: intcal09.14c # Reimer et al. 2009

% area enclosed	cal AD age ranges	relative area under probability distribution
68.3 (1 sigma)	cal AD 986- 1018	1.000
95.4 (2 sigma)	cal AD 899- 919	0.072
	963- 1026	0.928

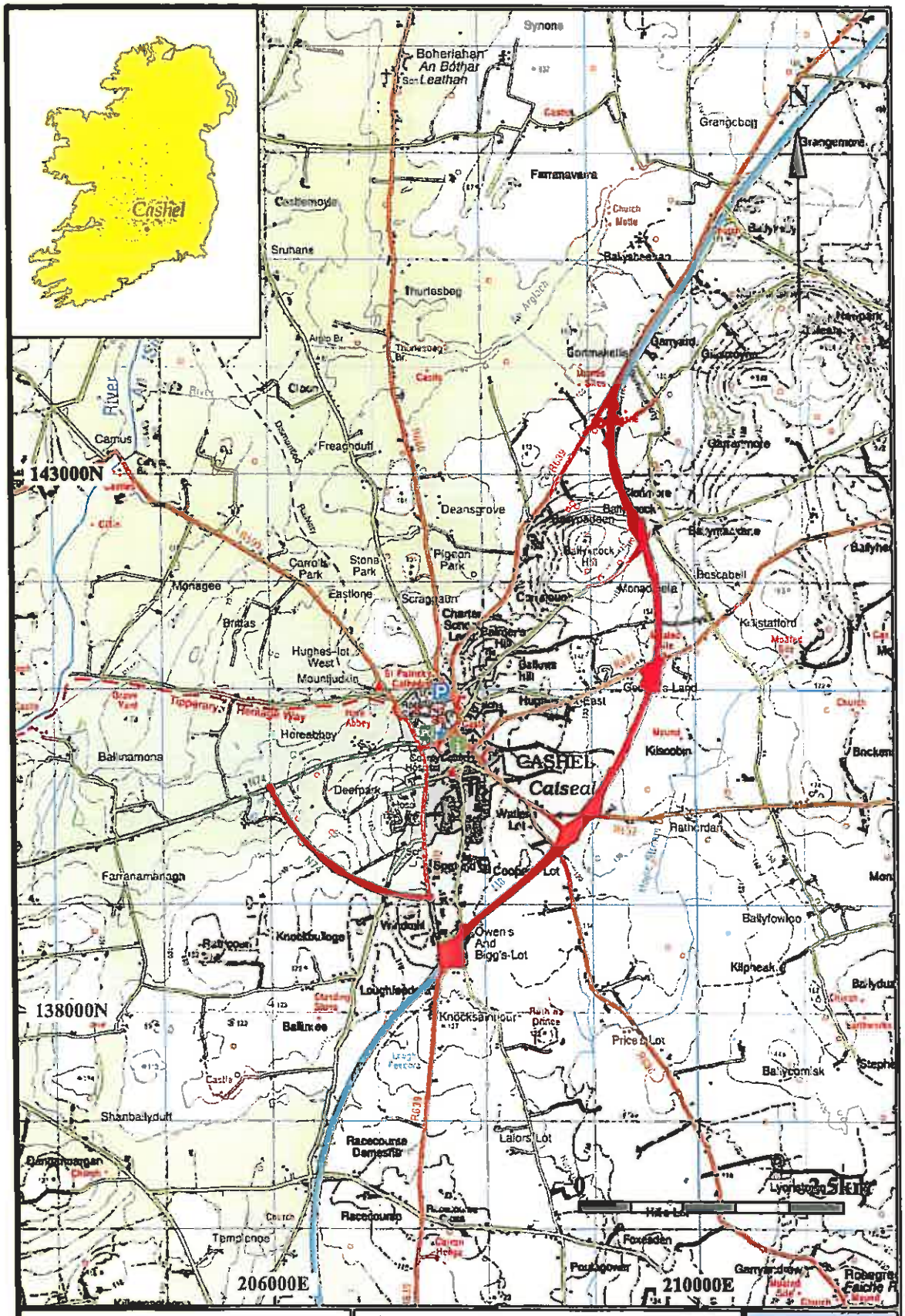
20 S13 201
UBA-13749
Radiocarbon Age BP 1992 +/- 31
Calibration data set: intcal09.14c # Reimer et al. 2009

% area enclosed	cal AD age ranges	relative area under probability distribution
68.3 (1 sigma)	cal BC 38- 9	0.331
	3- cal AD 29	0.495
	cal AD 38- 51	0.174
95.4 (2 sigma)	cal BC 51- cal AD 75	1.000

References for calibration datasets:
PJ Reimer, MGL Baillie, E Bard, A Bayliss, JW Beck, PG Blackwell, C Bronk Ramsey, CE Buck, GS Burr, RL Edwards, M Friedrich, PM Grootes, TP Guilderson, I Hajdas, TJ Heaton, AG Hogg, KA Hughen, KF Kaiser, B Kromer, FG McCormac, SW Manning, RW Reimer, DA Richards, JR Southon, S Talamo, CSM Turney, J van der Plicht, CE Weyhenmeyer (2009) Radiocarbon 51:1111-1150.

Comments:
* This standard deviation (error) includes a lab error multiplier.
** 1 sigma = square root of (sample std. dev.^2 + curve std. dev.^2)
** 2 sigma = 2 x square root of (sample std. dev.^2 + curve std. dev.^2)
where ^2 = quantity squared.
[ ] = calibrated range impinges on end of calibration data set
0* represents a "negative" age BP
1955* or 1960* denote influence of nuclear testing C-14

NOTE: Cal ages and ranges are rounded to the nearest year which may be too precise in many instances. Users are advised to round results to the nearest 10 yr for samples with standard deviation in the radiocarbon age greater than 50 yr.

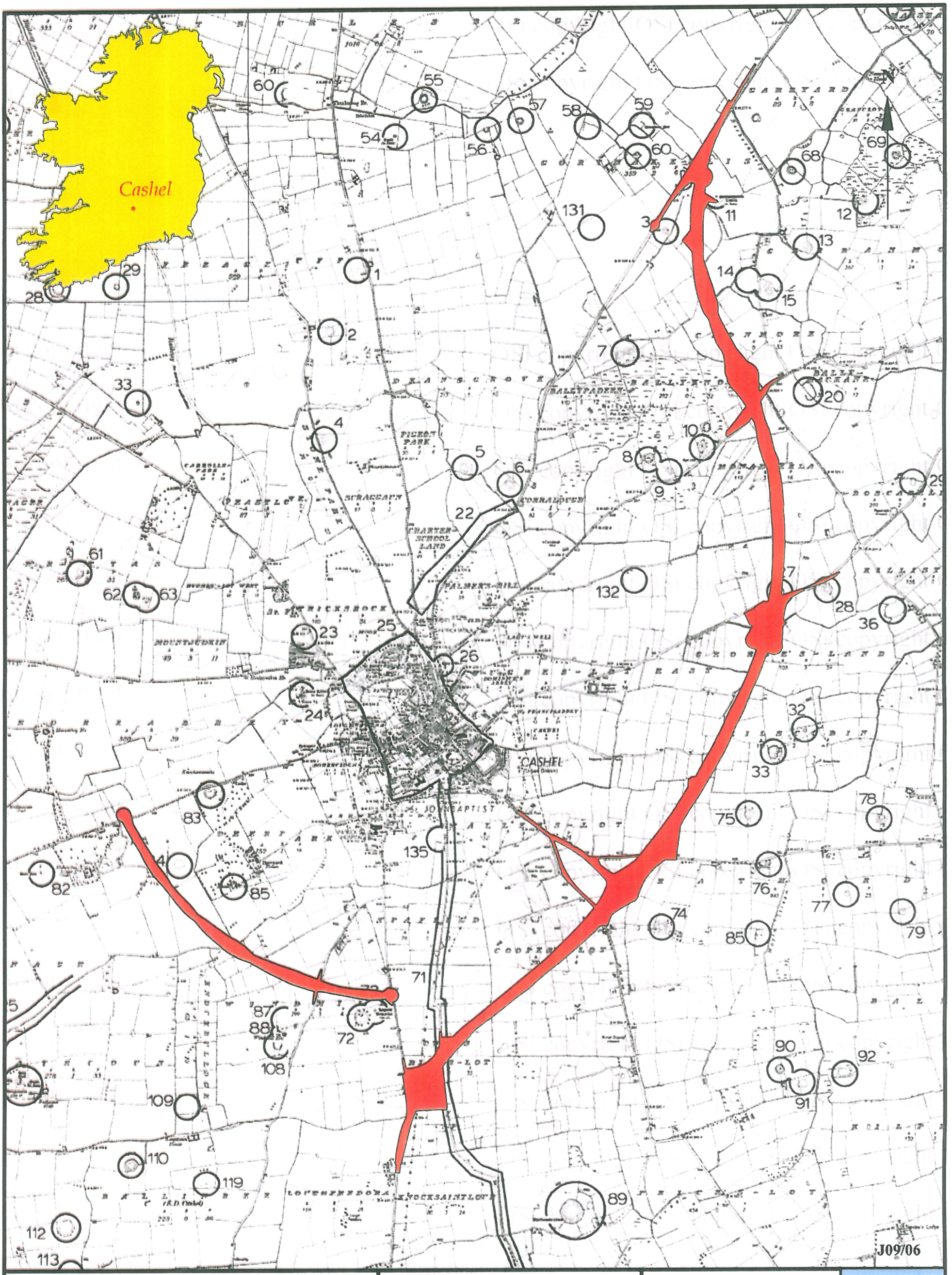


N8 Cashel Bypass & N74 Link Road, Co. Tipperary

Figure 1: Location of N8 Scheme

Scale 1:50 000

TVAS IRELAND LTD



N8 Cashel Bypass & N74 Link Road,Co. Tipperary

Based on RMP Map (1998) (SR) - sheet 52, 53, 60, 61, 68, 69.

Figure 2: Scheme Location & RMP Details

Scale 1:20 000

0 1km

TVAS IRELAND LTD

209600E

209700E

141700N

141600N

141500N

141400N

Site 12

Site 13

Site 14

Site 15

Site 16

Site 17

Site 18

N

Key:

- Water course/Pond

N8 Cashel Bypass & N74 Link Road, Co. Tipperary

Figure 3: Location of Sites 13-18

Scale 1:1000

Based on Ordnance Survey 1st Edition, Co. Tipperary, Sheet 61, 6"
Surveyed 1840-41. Copyright OSI & Govt. of Ireland. OSI Licence: AR0049410

0 50m

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209640E

209685E

Site 12

Fig. 5

N

Fig. 7

Limit of Excavation

E2

E3

141715N

Site 13

CPO Line

Fig. 6

Fig. 8

141675N

Site 14

N8 Cashel Bypass & N74 Link Road, Co. Tipperary

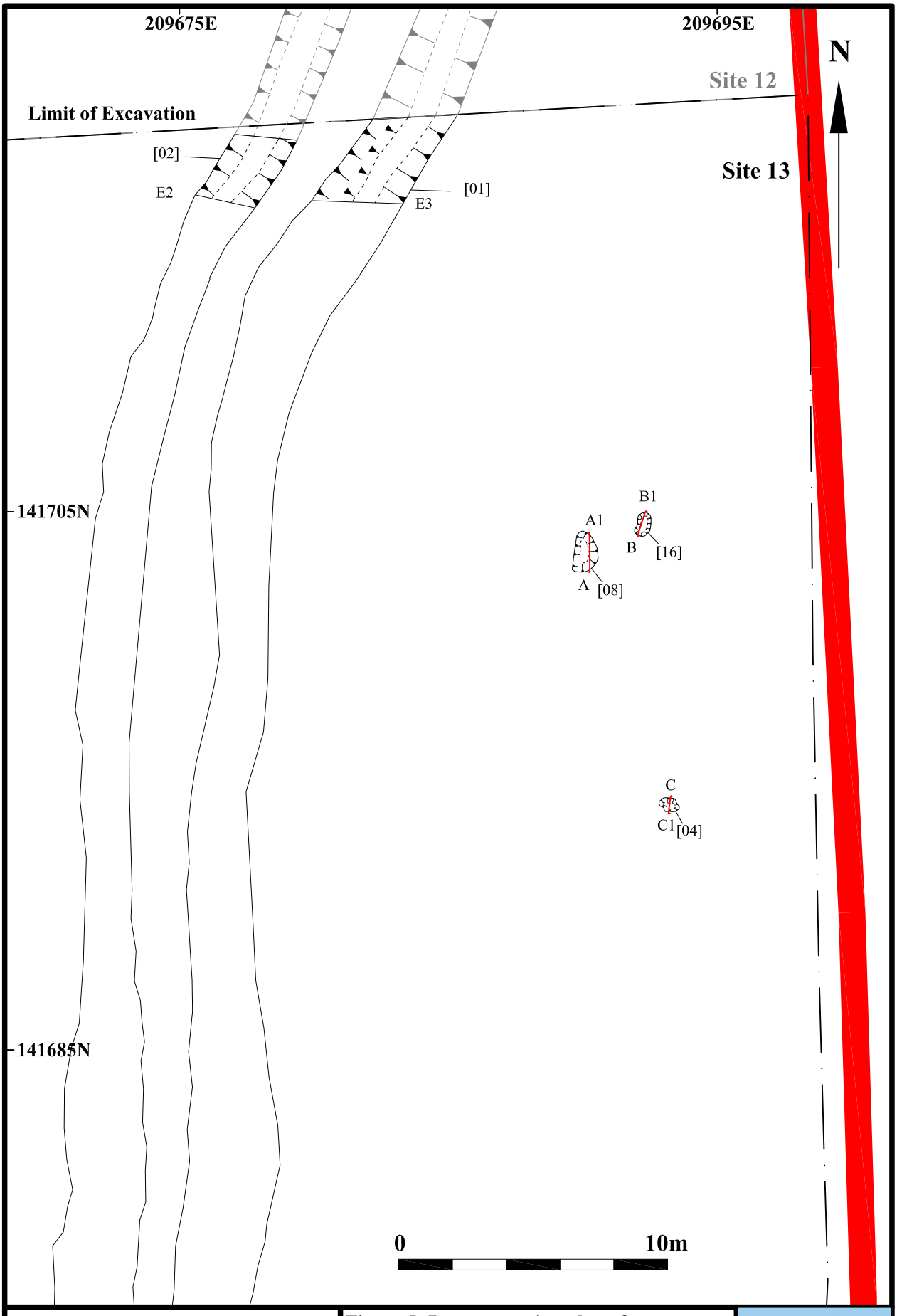
Monadreela, Site 13 03E0378

Figure 4: Post-excavation plan of Site 13

Scale 1:250

0 10m

TVAS IRELAND LTD

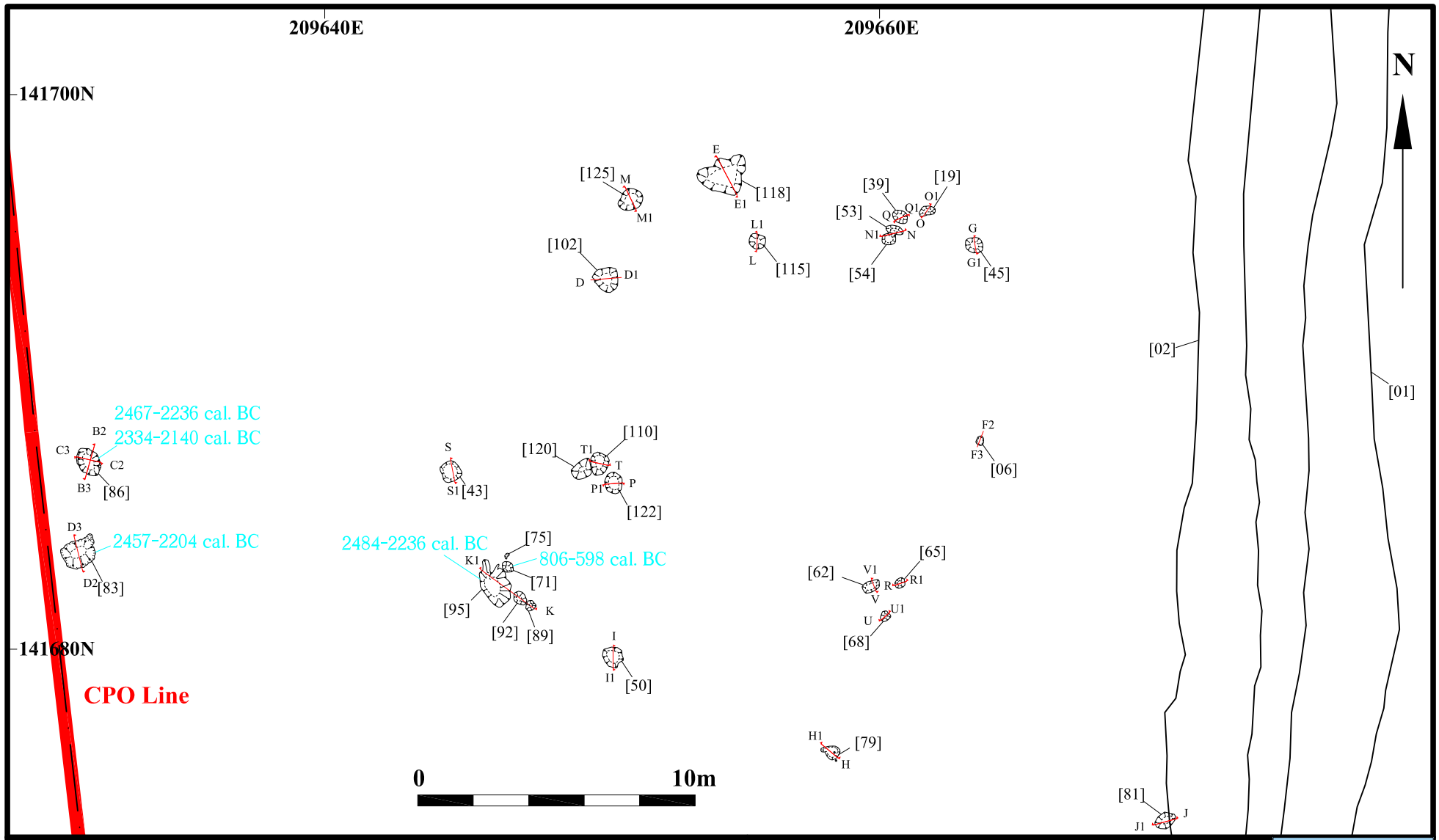


N8 Cashel Bypass & N74 Link Road, Co. Tipperary
Monadreela, Site 13 03E0378

Figure 5: Post-excavation plan of eastern part of Site 13

Scale 1:200

TVAS IRELAND LTD



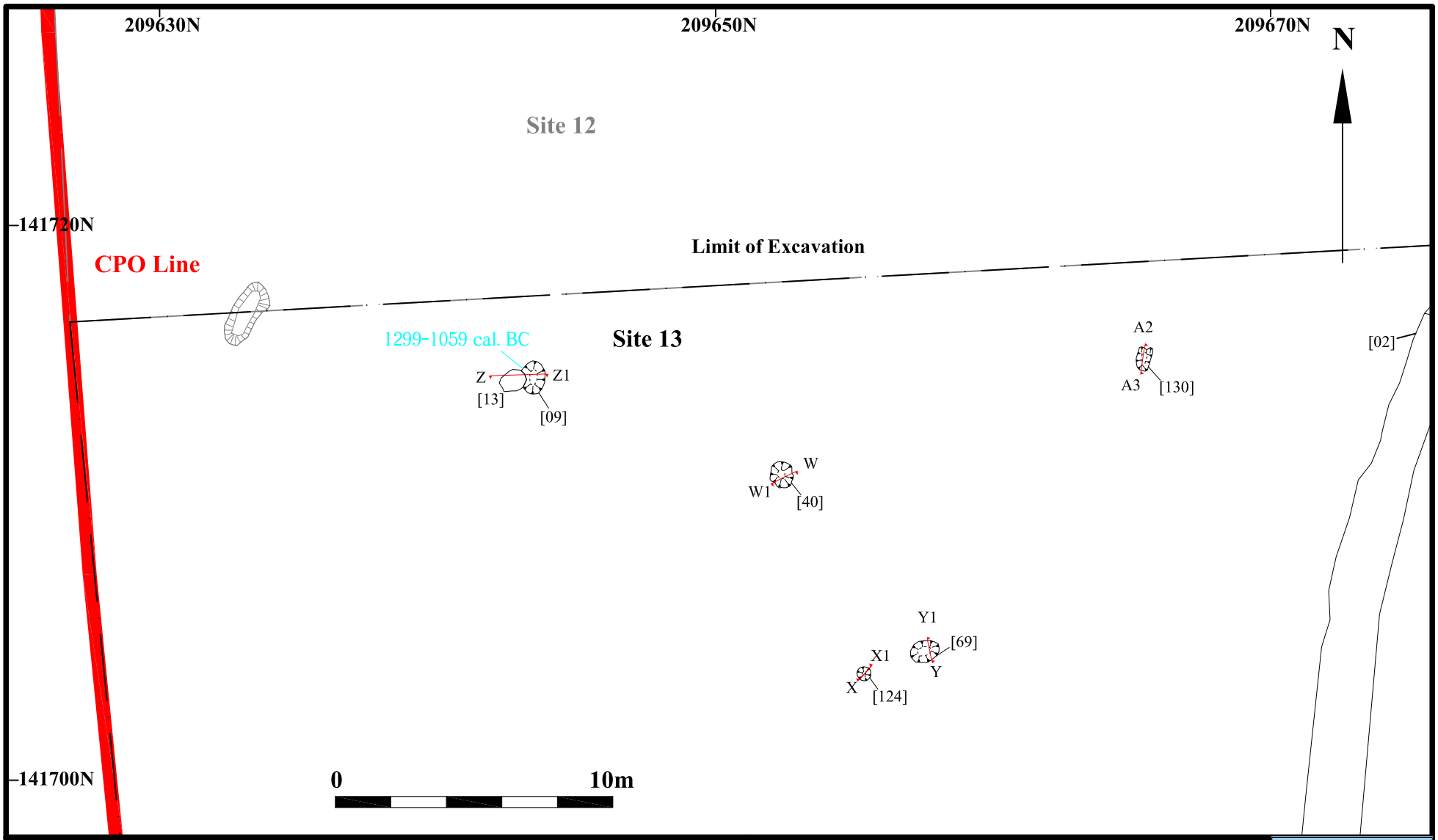
N8 Cashel Bypass & N74 Link Road, Co. Tipperary

Monadreela, Site 13 03E0378

Figure 6: Post-excavation plan of Site 13

Scale 1:200

TVAS IRELAND LTD

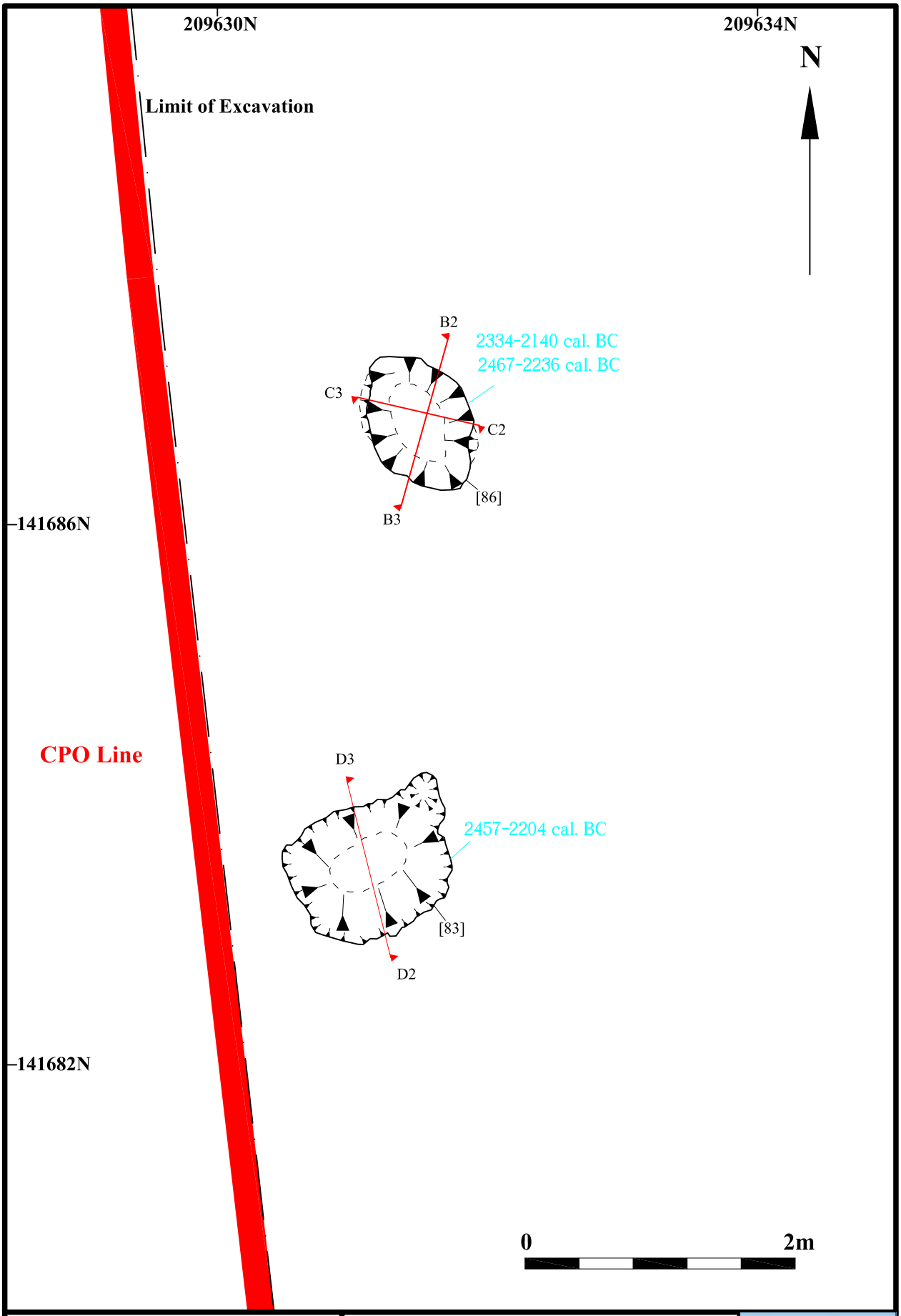


N8 Cashel Bypass & N74 Link Road, Co. Tipperary

Monadreela, Site 13 03E0378

Figure 7: Post-excavation plan of northern part of Site 13
Scale 1:200

TVAS IRELAND LTD

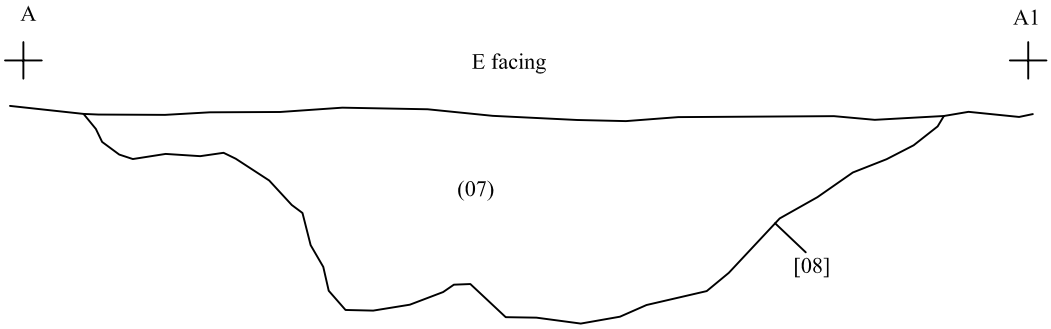


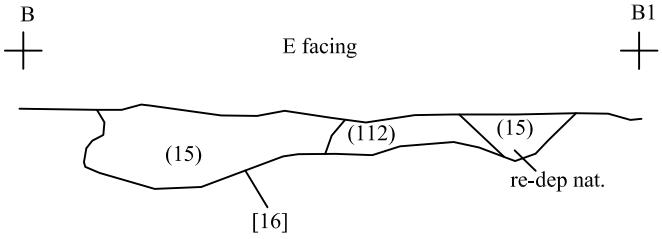
N8 Cashel Bypass & N74 Link Road, Co. Tipperary
Monadreela, Site 13 03E0378

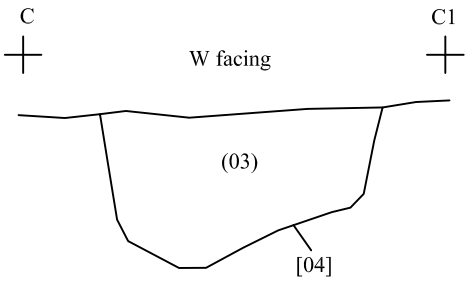
Figure 8: Post-excavation plan of Copper Age pits [86] & [83],Site 13

Scale 1:40

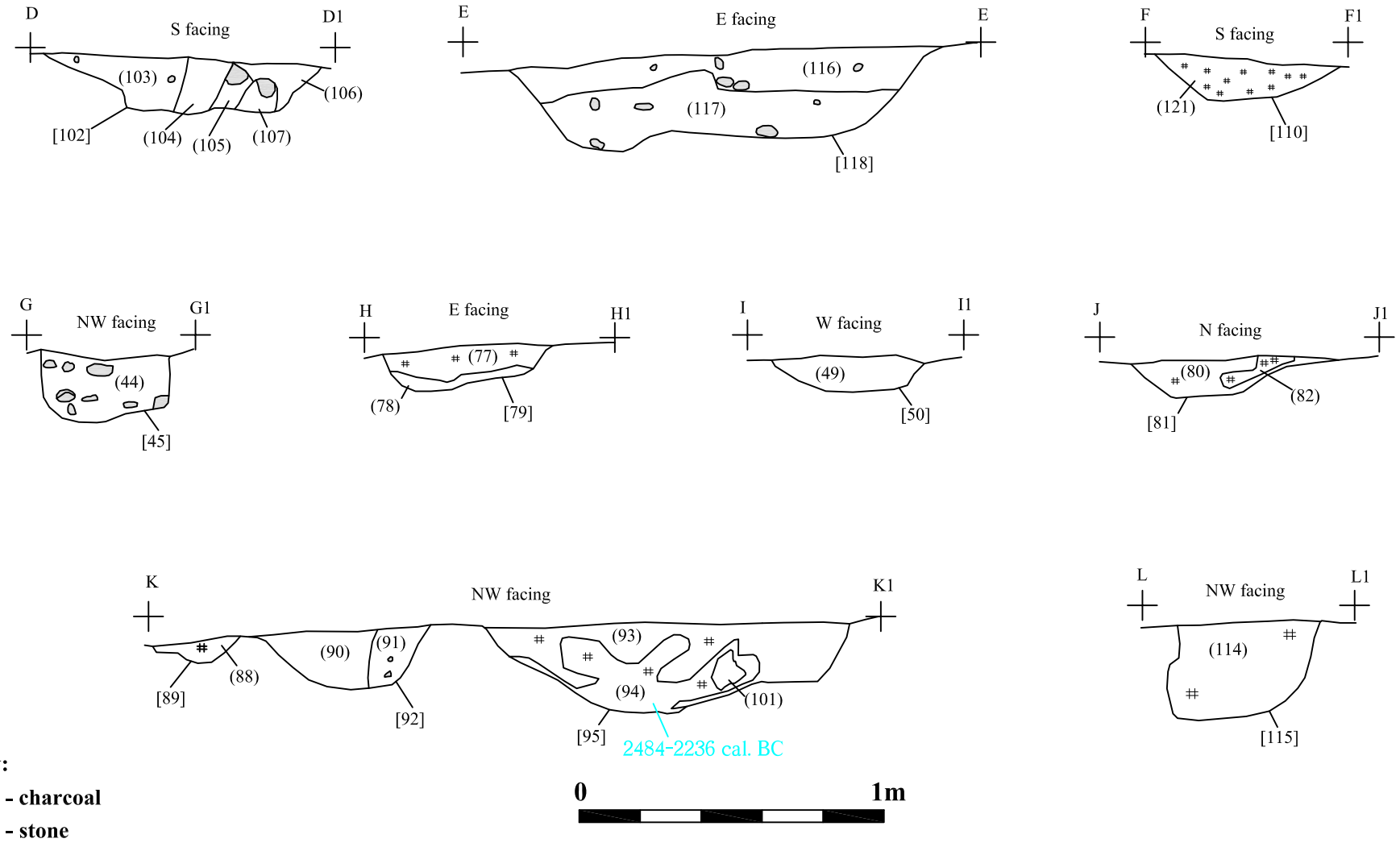
TVAS IRELAND LTD







N8 Cashel Bypass & N74 Link Road, Co. Tipperary **Monadreela, Site 13 03E0378**	**Figure 9: Sections from features at eastern end of Site 13** Scale 1:20	TVAS IRELAND LTD



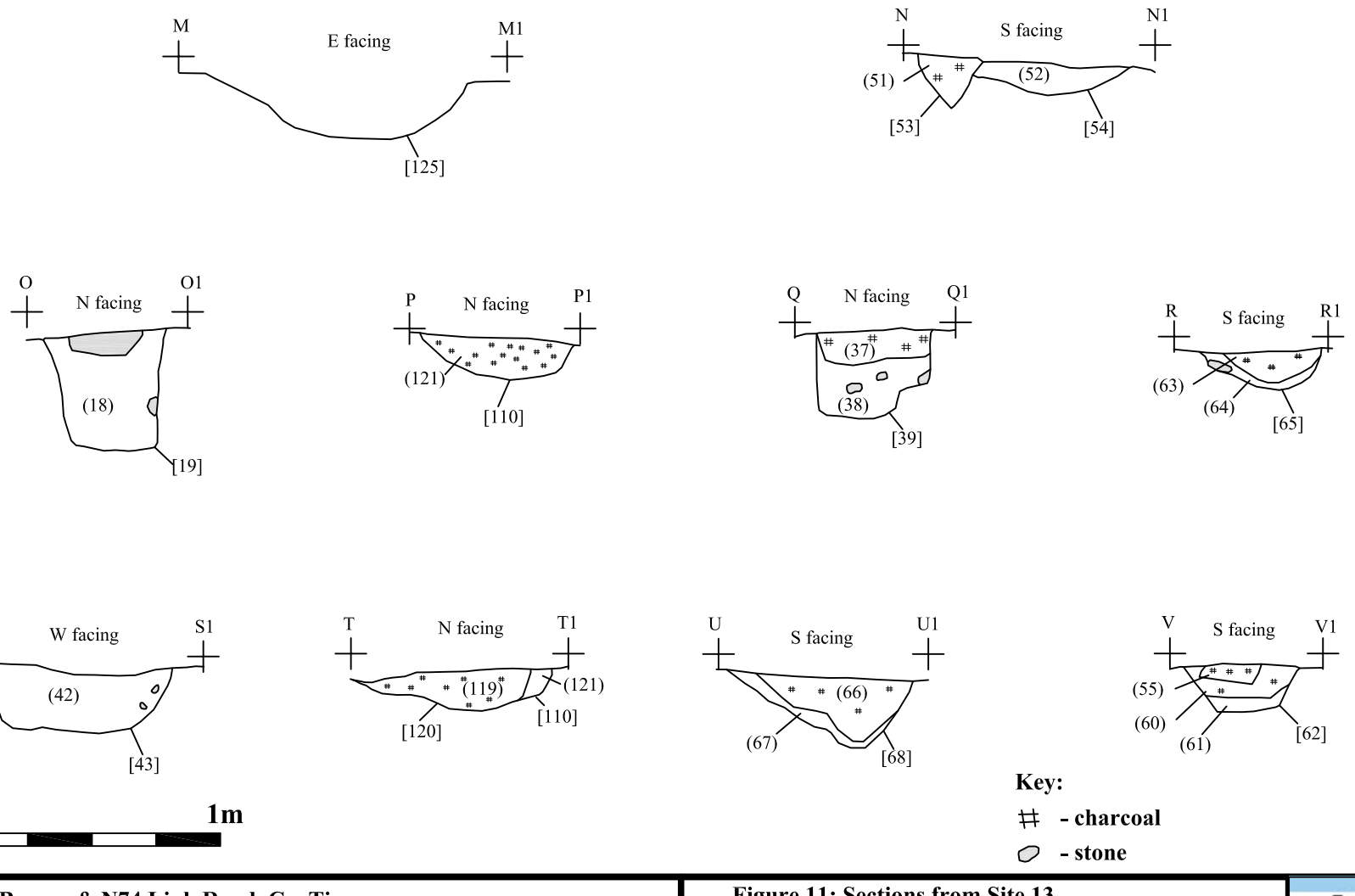
N8 Cashel Bypass & N74 Link Road, Co. Tipperary

Monadreela, Site 13 03E0378

Figure 10: Sections from Site 13

Scale 1:20

TVAS IRELAND LTD



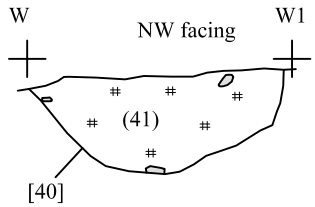
N8 Cashel Bypass & N74 Link Road, Co. Tipperary

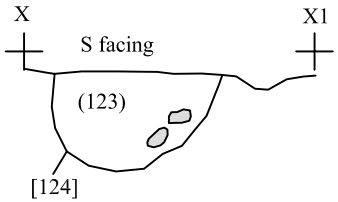
Monadreela, Site 13 03E0378

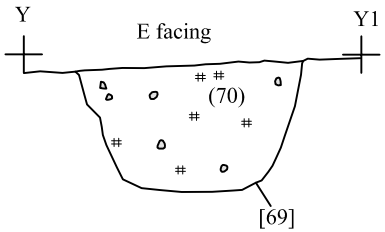
Figure 11: Sections from Site 13

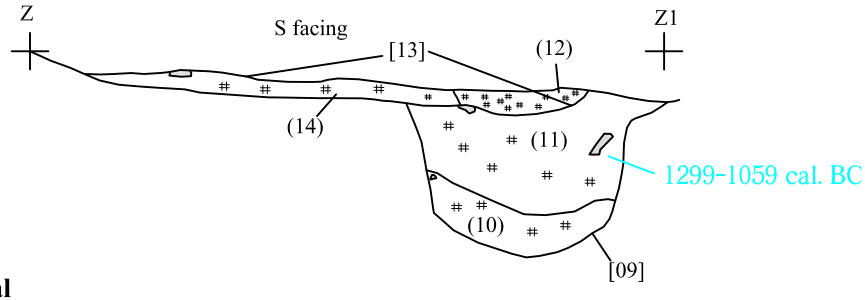
Scale 1:20

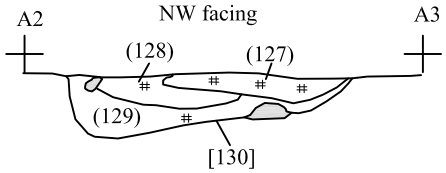
TVAS IRELAND LTD











Key:

 # - charcoal

- stone

0 **1m**

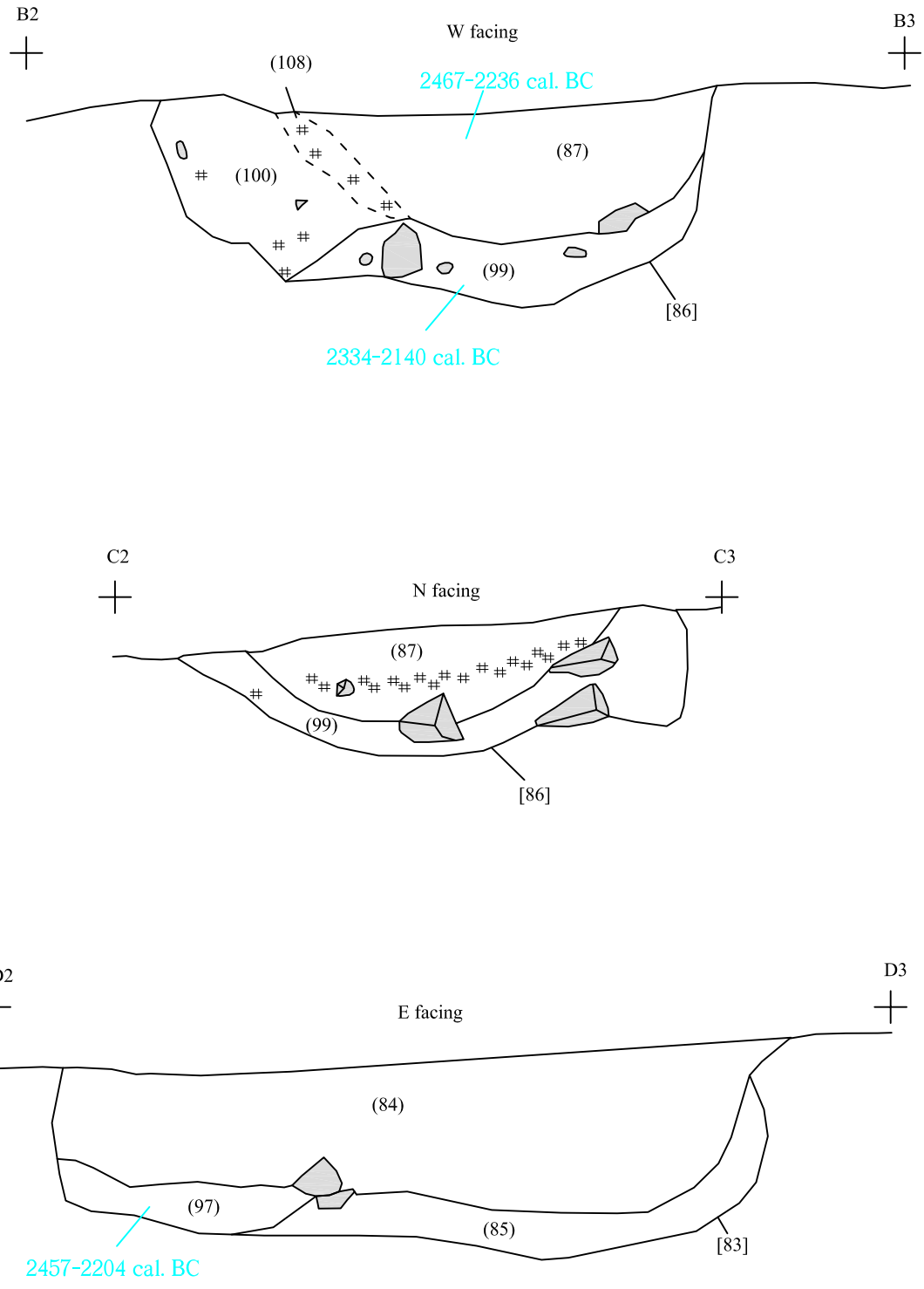
N8 Cashel Bypass & N74 Link Road, Co. Tipperary

Monadreela, Site 13 03E0378

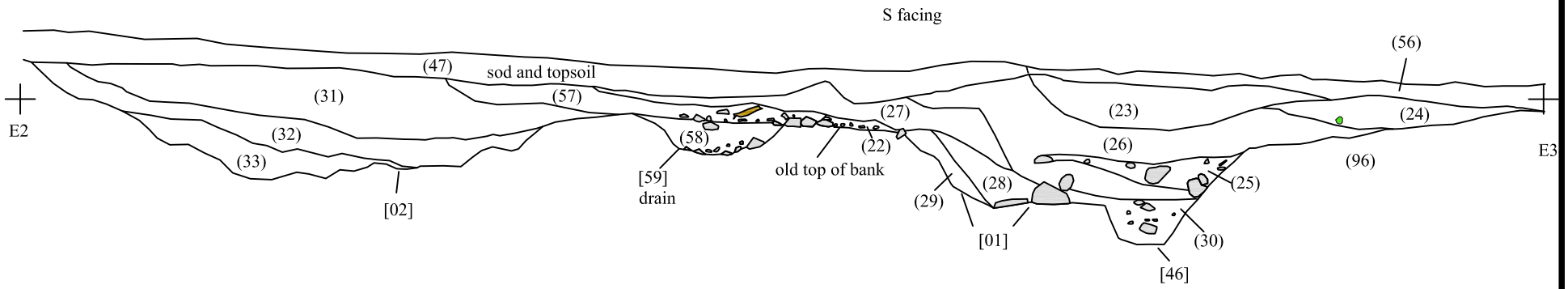
Figure 12: Sections from Site 13

Scale 1:20

TVAS IRELAND LTD



N8 Cashel Bypass & N74 Link Road, Co. Tipperary **Monadreela, Site 13 03E0378**	**Figure 13: Sections from Site 13** Scale 1:10	TVAS IRELAND LTD



Key:

- **- root**
- **- green glass bottle**
- **- stone**

0 **2m**

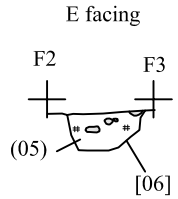
N8 Cashel Bypass & N74 Link Road, Co. Tipperary

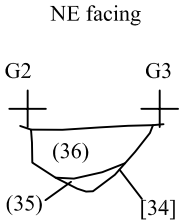
Monadreela, Site 13 03E0378

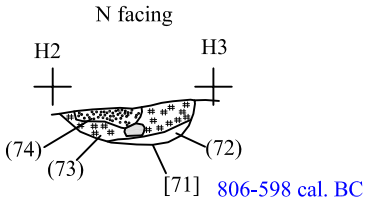
Figure 14: Sections from field boundary on Site 13

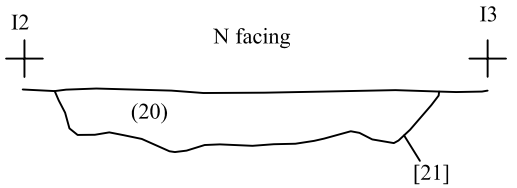
Scale 1:40

TVAS IRELAND LTD









Key:

 # - charcoal

- stone

0 **1m**

N8 Cashel Bypass & N74 Link Road, Co. Tipperary

Monadreela, Site 13 03E0378

Figure 15: Rest of the sections from Site 13

Scale 1:20

TVAS IRELAND LTD