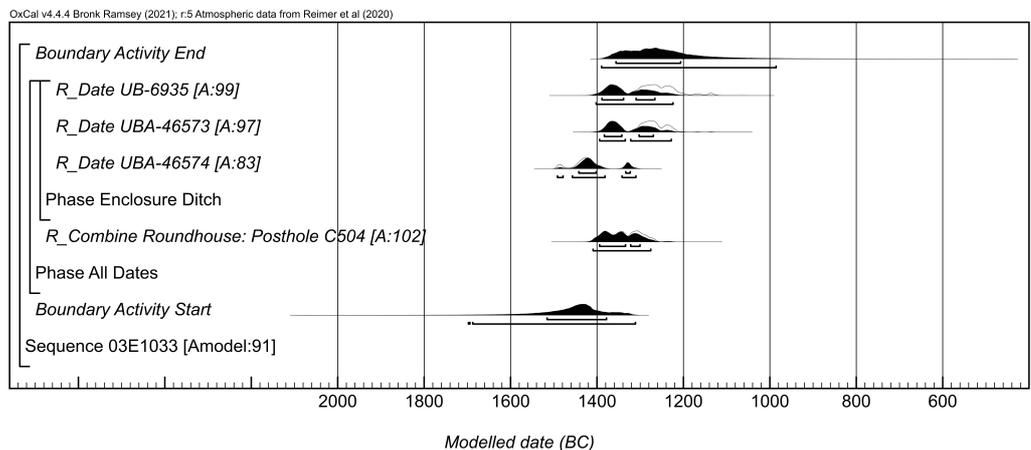
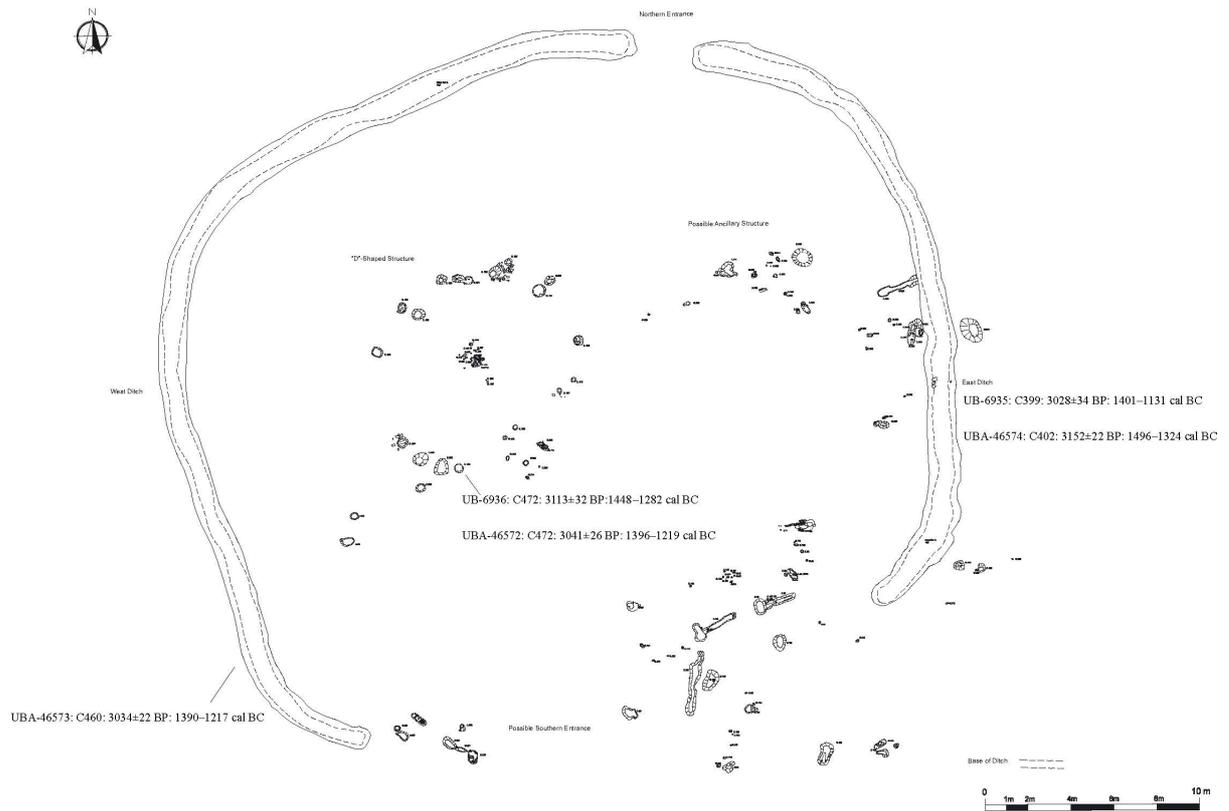


Radiocarbon Dating Scheme 2021

Ben Spillane

Submission Date	Feb 13, 2022 12:46 PM
1. Title:	Mr
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2.	
3. Grant programme	Archaeology C14 Radiocarbon Dates Scheme
4. Year awarded	2019
5. Title of project	New Radiocarbon Dates from a Middle Bronze Age Enclosed Settlement at Knockhouse Lower Co. Waterford.
6. Summary of report (Minimum allowed 100 words)	<p>This project focuses on re-dating material from the excavation of a Middle Bronze Age (MBA) enclosed roundhouse at Knockhouse Lower, Co. Waterford (03E1033). This site type is particularly characteristic of the period and this enclosure along with features in the immediate environs provide a microcosm of wider archaeological patterns. To provide an increased understanding of the chronology of this site, and the distinctive pottery assemblage recovered from the enclosure ditch, three radiocarbon samples were selected through the Royal Irish Academy C14 dating scheme. The results reaffirm the MBA date of the site, specifically from the 17th to 13th centuries BC.</p>





8. Please outline the objectives of the project

1. Gain secure, short-lived samples to test the accuracy of the charcoal dates from the original excavation.

The original dating of the site is based on two radiocarbon dates. UB-6936 (1448–1282 cal BC), was from a charred oak post from the postpipe fill (C472) of posthole (C504) in the interior roundhouse. The associational quality of this date is excellent considering it is a piece of material directly related to the construction of the house, however, as it is oak stemwood, it could be to subject to the old wood effect. UB-

6935 (1401–1131 cal BC), is from oak charcoal from the eastern ditch re-cut fill (C399). This oak sample, derived from fragments weighing <1g, is likely to be subject to the old wood effect. Additionally, the fragmentary state of the charcoal and its small volume suggest that it could be residual rather than a primary, secure deposit. Charcoal is one of the most commonly dated materials in Irish archaeology, however there are a number of potential problems with its reliability, chiefly old carbon offsets and the potential for post-depositional movement. The dates from this project were chosen to test the reliability of the original charcoal dates.

2. Incorporate these samples into a Bayesian chronological model of the site and surrounding landscape.

The site is a good example of an MBA enclosed settlement. The site and its immediate environs contain a multitude of features and cultural practices that are representative of wider patterns in the Irish MBA archaeological record. This includes an enclosed roundhouse, boundary markers, deposition of material culture in boundaries, cremation activity, hearths, Fulacht Fiadh activity, unenclosed roundhouses and collections of pits, postholes and stakeholes. The acquisition of dates from this site will allow for the construction of a Bayesian model for the enclosure itself and the surrounding area. This will provide an improved understanding of the history of the settlement and its relationship with the surrounding activity.

3. Provide radiocarbon dates for the pottery assemblage, a rare example of a large, primary deposit of MBA material culture on a domestic site.

A large ceramic assemblage was recovered from both sides of the enclosure ditch. The analysis, carried out by Anna Brindley, resulted in the identification of 18 reconstructed vessels. Brindley attributed the pottery to the cordoned urn tradition based on the presence of cordons on some of the vessels, the large bucket- and barrel- shaped forms and the manufacture techniques, typologically dating to 1600–1500 BC. This assemblage is a nationally important example of the transitional stage of ceramics from the earlier to later Bronze Age as it contains elements of both cordoned urn ware and domestic coarseware. Due to an overwhelming conformity to plain coarseware pottery, it is difficult to chronologically differentiate vessels without the use of radiocarbon dating. As this assemblage represents a more clearly defined transitional phase between the two ceramic traditions, the acquisition of dates derived directly from the vessels will be useful in understanding the development of later Bronze Age pottery.

9. Please describe the methodology used in conducting the research

The dating methodology was informed by a Bayesian Modelling approach. This process requires samples that minimise the gap between the dated event (the death of the sample) and the target event (the date of the associated archaeological activity). Accordingly, short-lived samples were selected that were in-situ, minimally impacted by post-depositional taphonomic processes, and had a clear connection to the archaeological event in question.

UBA-46572: 03E1033:472:143: 40mg: Charred naked barely grains from a cache of 1708 carbonised barley grains located in posthole C504, from the interior roundhouse. The deposit was from the postpipe C473, stratigraphically linked with the dated charred oak post. There was no evidence of a recut or disturbance to this context which would suggest that the cache was a deliberate deposit made during the insertion of the post.

UBA-46573: 03E1033:460:133: 20mg: Carbonised residue on exterior surface of pot 14. The sherds of this straight-sided vessel were recovered from fill C460; the primary fill of western enclosing ditch cut C447. The majority of the vessel was represented, suggesting minimal impact from taphonomic processes. Additionally, this pot was located within the primary ditch fill below ditch recut C505, indicating a close link to the initial ditch construction.

UBA-46574: 03E1033:402:5: 20mg: Carbonised pottery residue from the interior base of pot 9. Sherds from a small barrel-shaped vessel recovered from primary basal fill C402 of the eastern enclosing ditch C427. Most of the vessel was represented by the recovered sherds, suggesting that it was deliberately deposited in-situ rather than the result of post-depositional movement. Its location in a basal fill links it closely with the initial construction of the ditch.

The pottery assemblage was in the possession of the Waterford Treasures Museum (location provided by Ms Penny Johnston). With the permission of Ms Rosemary Ryan (Keeper of Bishop's Palace), the assemblage was accessed and sherds with charring from the vessels were obtained. After liaising with NMI Assistant Keeper of Antiquities, Dr Niamh Curtin, the sherds were hand delivered to the Collections

Resource Centre at Swords on 18/06/2021 and the charred material was extracted by conservator Ms Carol Smith. The barley sample was stored in the Collections Resource Centre and access to this material was provided by Dr Curtin. Once all samples were identified and prepared for transportation, the licensure for exportation and alteration of the material was completed with the assistance of Dr Curtin. The NMI took custody of the samples, and they were hand delivered to the 14Chrono centre by Isabella Mulhall in November 2021. The results were returned in January 2022.

Upon obtained the results, all dates from the site were inserted into a Bayesian model using OxCal version 4.4.4. This combines the standardised likelihoods (the dates) with prior information (the excavation record) to provide posterior density estimates for the start and end of activity at the site. The model utilised a »Uniform Prior«, which assumes that at one time there was no activity at the site, then there was, after which the activity occurred relatively uniformly until it stopped.

10. Please outline the findings of your research and/or milestones achieved

UBA-46572: 3041±26 BP: 1396–1219 cal BC (95.4%)

UBA-46573: 3034±22 BP: 1390–1217 cal BC (95.4%)

UBA-46574: 3152±22 BP: 1496–1324 cal BC (95.4%)

Objective 1: The results confirm that the site dates to the MBA. To test the internal consistency between the statistical scatter of the new and old dates (the likelihood that the death of the samples occurred contemporaneously), the R_Combine function was utilised in OxCal. The date from the barley grain deposit in postpipe C473 was statistically consistent with the original date from the charred oak post in the same context. This indicates that the oak date was not significantly affected by the old wood effect and both samples provide a reliable estimate of the construction of the roundhouse in the late 15th to 13th centuries BC.

The date from vessel 9 and the original oak date in the eastern ditch failed the R_Combine test. This is not surprising given that the oak was derived from a middle fill, stratigraphically post-dating the basal pottery sample. An R_Combine test between the dates from vessel 9 and vessel 14 from the eastern and western ditches failed, with vessel 9 being older. This is an unexpected result, given that the two vessels were derived from basal deposits assumed to be related to the initial cutting of the ditch. It is unlikely that the eastern ditch was constructed considerably earlier than the western ditch. A more plausible explanation is that the deposition of pottery in the enclosure was a long-lived phenomenon. Extensive research on deposition of material culture in Irish and British Bronze Age settlement enclosures has concluded that the practice represents a symbolic act rather than dumping of refuse, reinforcing boundaries and space (see publications by J. Brück or K. Cleary). Therefore, the deposition of the numerous vessels could have occurred over a prolonged period, and the assemblage kept deliberately visible to inhabitants through routine cleaning out of the ditch. This practice may have ceased when the ditch was deliberately backfilled, possibly as an act of destruction.

Objective 2: All dates from the site were incorporated into a Bayesian model. The posterior density estimate for the start of activity at the site is between 1700–1315 cal BC (95.4% Probability) probably between 1520–1380 cal BC (68.3% Probability). The end of activity at the site occurred between 1390–990 cal BC (95.4% Probability) probably between 1360–1210 cal BC (68.3% Probability). The total span of dated activity at the site to be 0–215 years (95.4% Probability), probably 32–170 years (68.3% Probability).

Objective 3: The dates derived from the pottery vessels broadly confirm the typological dating for the assemblage proposed by Brindley of c.1600 BC. Vessel 9 closely correlates with this typological date. The later date from vessel 14 places part of the assemblage later in the MBA, consistent with dates from coarseware vessels from Tinoran Hillfort and Chancellorsland. This 'domestic cordoned urn' assemblage therefore seems to have considerable overlap with the more widespread coarseware tradition.

11. a) Please provide details of the dissemination of the outcomes from this project (inc. publications, presentations, outreach, media etc.) including details of any social media/web platforms used to publicise this project

I have outlined the importance of the Knockhouse Lower enclosure in a chapter on the general archaeological heritage of east Waterford in a forthcoming volume aimed towards a lay public audience (McGrath, R. ed. Forthcoming, 'The Gaultier Story: Aspects of Waterford's Maritime Barony'). In addition, a seminar on the results of this project has been presented at the University College Cork Department of Archaeology, aimed at an Academic audience.

b) No. of Academic Papers/articles

0

published:

c) No. of Lectures given/outreach events involved in: 1

d) Media Coverage (article in local newspaper, feature on University website etc.): 0

e) How will you continue to communicate the results of your project and what are your publication plans?

The dissemination of the results of this project will be part of my PhD outputs. My results chapter will focus on specific types of MBA archaeological sites and settlement patterns, with enclosed settlements being used as specific case studies. These case studies will form the basis of a publication on the morphology, chronology and landscape context of MBA enclosed sites, to be compared with other notable sites such as later Bronze Age hillforts. This will be drafted after the submission of my thesis in June 2022. This paper will be submitted to the Proceedings of the Royal Irish Academy.

After contact with Ms Rosemary Ryan to obtain the pottery samples, it was agreed to organise a public presentation on the site and the new dates in Waterford Treasures Museum, which will take place at a later stage in 2022.

15. How did the award enhance your professional development (e.g. in terms of specific opportunities, opportunities for enhancing skills, collaborations with others etc.)?

This award allowed me to put skills acquired through my PhD research into practice in a professional setting. An integral part of my training during the PhD was in Bayesian chronological modelling and the necessity of high-quality radiocarbon samples based on their lifespan and contextual quality. Most of my research focused on reviewing legacy dates derived from commercial schemes of the Celtic Tiger years. I had not previously had the opportunity to access archaeological collections or choose my own samples for the construction of high-quality models. Thanks to this award, I was able to choose samples that addressed specific questions that form a significant element of my research.

In addition to this, the award allowed me to gain invaluable experience in interacting with the various archaeological institutions necessary when undertaking archaeological research projects. Most significantly was my interaction with the National Museum of Ireland, specially liaising with museum staff to access collections of archaeological material. I also worked to seek permission from commercial companies to access the material, coordinated with county museums, learned the procedures required for the delivery of archaeological material, and learned the procedure for filling out the licensure for the exportation and alteration of artefacts.

16. What plans (if any) do you have to further your proposal/project?

The immediate plan to further this project is to incorporate the results into a wider case study of lowland enclosed settlements of the MBA in southeast Ireland as part of my PhD research. As previously stated, these site types incorporate many elements of the wider patterns of archaeological activity of the period, which rarely all occur in one specific complex. Therefore, these sites are particularly important in the corpus of Middle Bronze Age archaeology and can potentially shed light on the societal structure during this period of later prehistory. Specifically, the start and end posteriors provided by the Bayesian model will be compared to those from other similar enclosure sites identified from my research such as Chancellorsland, Camlin/Derrymore Co. Tipperary or Drumgold, Co. Wexford. This will investigate whether there was a specific point in time when these sites began being built. The current theory states that these settlements began to be built commonly in the transitional period between the Early to Middle Bronze Age, coinciding with a significant increase in human activity during the 17th to 13th centuries BC. In addition,

these sites will be compared with hillforts, which began to be built during latter stages of the MBA but see their main floruit of use during the Late Bronze Age. After the completion of my PhD, I hope to investigate the potential for further targeted excavation of these site types, with specific research questions in mind. With few exceptions, such as the Discovery Programme's excavations of Chancellorsland, Co. Tipperary, these sites have only come to light as an important element of the later Bronze Age because of widescale infrastructural development. Sites like Knockhouse Lower were not previously visible as upstanding monuments and were only identified by sub-surface investigatory techniques. Because of this, it may be preferable to conduct further research on known examples, rather than searching for new ones. To that point, another enclosed site is located at Ballydavid, Co. Tipperary, excavated during the M8/N8 Cullahill to Cashel Road Improvement Scheme. Dated to the Late Bronze Age from one charcoal date, this site possesses many similar elements to Knockhouse Lower, such as an enclosure ditch, Domestic Cordoned Urn pottery deposition within the ditch and internal structures. The enclosure was not excavated in full as the north-eastern section lay outside the road take, although geophysical survey confirms that it continues on this side. Targeted excavation of the enclosing elements in this portion of the site with multiple dates from the fill of the ditch could be useful in establishing an intrinsic understanding of the sequence of depositional events in the enclosure and would provide accurate estimates for the start, duration, and ending of the enclosure.
