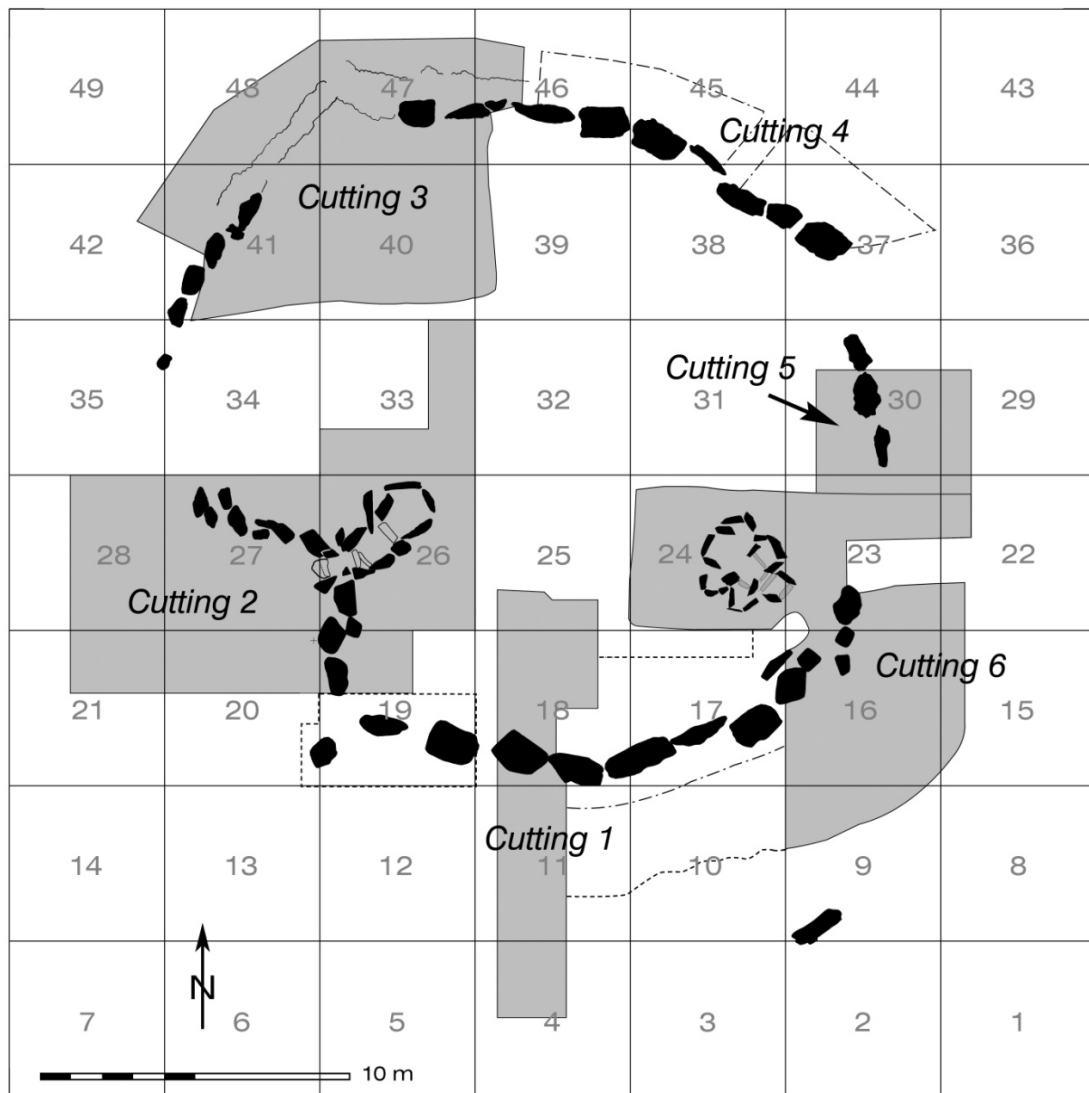


# Report on Post-Excavation Research - Knockroe Passage Tomb, County Kilkenny

Royal Irish Academy 2021 Archaeology Legacy Grants Scheme

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--- excavated to expose kerbstones      - - - - - de-sodded and drawn

Plan of the passage tomb monument at Knockroe, county Kilkenny (Licence No. E554), showing the excavation grid, excavation cuttings and principal structural elements.

This report deals specifically with progress made since confirmation of a Royal Irish Academy grant for €21,409 was received in May 2021. An extension to 31<sup>st</sup> October 2022 has been granted for the final report. This is deeply appreciated. However, given the circumstances outlined in the interim report, some leeway is requested on the grant condition that the osteoarchaeological report must be completed before the radiocarbon dating programme is undertaken (see final paragraph below). The major projects undertaken over the summer and autumn were as follows:

1. Comprehensive analysis, ordering and general tidying of the archive (paperwork, electronic record, artefacts and samples), associated interaction with the NMI and NMS, and purchase of storage boxes – paid from RIA grant
2. Completion of draft specialist reports on faunal bones, antler, lithics, and stone beads/pendants – pro bono assistance or funded from PTP project
3. Significant progress on osteological analysis of (mainly cremated) human bone – pro bono work by specialist Dr. Jonny Gebber and further assistance funded by PTP project.

The major outstanding tranche of work is the radiocarbon dating programme which has been delayed because of a condition imposed with the grant.

### **Finance**

Figure 1 at the end of this document provides a statement on expenditure to date set against the grant budget, with supporting documentation in Figures 2 and 3. The main expenditure has been the research assistant's remuneration, of which €7,685.00 has been paid out (fig. 2) and the remainder of the original €8,700.00 budget has been claimed for October and will be paid at the end of November 2021. In addition, €510.00 has been paid for storage boxes and itemised on the UCD system as Office Supplies. As the actual cost of the storage boxes (fig. 3) exceeded the grant budget, the shortfall was made up from sources other than the RIA grant. The main outstanding item of expenditure is the Radiocarbon Dating programme which is delayed because of a condition attached to the grant and is the reason for the extension to 31<sup>st</sup> October 2022. The amount set aside for slide-scanning remains unspent to date for reasons outlined below, but this element will be completed in time for the final report.

### **Research Assistant**

This is the major item of expenditure from the grant to date. Following an open competition, Ann Frykler-Hadbidge, a specialist in post-excavation processing, was recruited as a research assistant to work on the Knockroe project from July to October during which she completed the following:

- An all-inclusive inventory of Knockroe materials in the UCD laboratory;
- A comprehensive and exhaustive finds catalogue with measurements, including both ancient and modern material as requested by the National Museum (Appendix 1). This involved cross-referencing all finds and samples with original and interim registers and reports, identifying and solving numbering issues arising from the multi-season nature of the excavation as well as the continuing discovery of new artefact fragments during screening/analysis of cremated bone, and resolving occasional occurrences of unnumbered or double-numbered items.

- Analysis of site archives, including the removal of irrelevant documents and confirmation of what needs to be done with slides, prints, digital photographs and field drawings.
- Engagement with the National Museum, National Monuments Service and conservator Susanne Kelly in order to ensure the material is in order for handover to the state, as well as preparing an excavation table for the NMI and arranging the acquisition of appropriate storage boxes and packaging materials.
- House-keeping such as labelling, re-labelling and tagging finds and re-writing associated finds bags; washing and labelling post-medieval finds; washing some hitherto unprocessed bone samples.
- Listing of issues still to be finalized, such as the completion of the finds register as the study of human bone continues, the selection and digital scanning of slides, the final packaging process and the hand-over of material to the NMI and NMS.

In my view, what was achieved by this specialist was outstanding and I have been impressed by her dedication and professional expertise.

### **Progress in other areas**

The organisation of the material facilitated by the RIA grant enabled some specialist studies of the material from the excavation to take place over recent months. In addition to Dr. Jonny Geber's study of the human bone, discussed further below, the following was also achieved:

- Zooarchaeologist Dr. Fabienne Pigiere recently completed a review of all animal bone and antler from the site, including artefacts (Appendix 2).
- Dr. Ruth Carden, a zooarchaeologist who specialises in deer, has provided further comment on the antler collection (Appendix 3).
- Professor Graeme Warren has examined the lithic collection (Appendix 4).
- Dr. Steve Mandal has examined all beads and pendants from the site (Appendix 5).

In addition, Dr. Helen Roche is satisfied that her earlier report on the pottery is acceptable as her final report but this may be revisited in the light of any additional fragments that might be found amongst the cremated bone.

The planned publication will now require additional sections, as distinct from appendices, on the human remains, artefacts, faunal remains and radiocarbon dating programme.

### **Slide-scanning**

When specific quotes were received for the scanning of slides, it was realised that only a selection of the collection could be scanned from the grant budget. The selection process is ongoing and the scanning will be completed in time for the final report in October 2022.

### **Human bone analysis**

Although not funded by the Royal Irish Academy grant, this other major project is a necessary prelude to the processing of samples for radiocarbon dating, which is funded by the RIA, and is made possible by the Passage Tomb People (PTP) project. The PTP project is covering the travel and subsistence costs of osteoarchaeologist Dr Jonny Geber (University of Edinburgh) who has agreed to

work on the Knockroe human bone assemblage *pro bono* and has provided an interim report on his work to date (Appendix 6). The PTP project is also covering the cost of a separate research assistant to help Dr Geber with the sorting and weighing of the bone fragments. To date, these costs total €4337.73. As work progressed and the total weight of the cremated bone from Knockroe emerged by September, it came to c. 240 kg (For comparison, this is more than three times the weight of cremated bone from the entire site at Knowth – see Ch.3, The Human Remains, in *Excavations at Knowth* Vol. 6, RIA Monographs in Archaeology).

Dr. Jonny Geber worked intensively on this material from 22 July to 27 August 2021. He established that he would need to begin the analysis *ab initio* because the intermittent studies of the collection undertaken previously were not just incomplete but inadequate for his purposes. This arose from recent analytical developments, not least the application of standardized analytical procedures in relation to cremated bone, and the unusually extreme amount of fragmentation at Knockroe.

At Knockroe, considerable disturbance had occurred in both tombs due to insufficient cairn cover, collapsed roof-stones, construction of a drystone wall and tree/shrub intrusion. Consequently, in order to aid the specialist studies, the various collections of cremated bone from the site were ordered in terms of the security of their location when found, based on the previously-completed stratigraphical analysis. Those considered most likely to have been undisturbed and Neolithic were classed as Tier 1; those considered to be probably undisturbed and early but possibly containing some Early Bronze Age deposits amongst the Neolithic material were classed as Tier 2. Further pockets of cremation that were likely to be undisturbed have also been identified but, otherwise, much of the cremated bone occurred in contexts that were probably or obviously disturbed, such as clearly re-deposited layers closer to the modern surface, strata that included more recent as well as ancient material and cremated bone fanning out along the platform from the entrance to the West Tomb, presumably thrown or walked out as found also at the Mound of the Hostages, Tara. The Tier 1 (most secure) group included layers from both tombs, including Context 216 in the West Tomb which contained an enormous quantity of cremated bone and represented the main fill of the tomb. Dr. Geber's osteological analysis began with the Tier 1 contexts, which have now been completed, and major inroads have also been made on the Tier 2 contexts, especially C216.

From 16<sup>th</sup> August, a research assistant Sara Dickson (current UCD postgraduate student) worked for two weeks alongside Dr Geber sorting and weighing the cremated bone fragments, which greatly sped up the analysis. On returning to Edinburgh at the end of August, Dr Geber had examined c.70.3kg (30%) of the Knockroe cremated bone. He plans to complete his study of the human bone over the coming months and to facilitate this the research assistant continues to sort and weigh the remaining bone, currently one day per week at UCD. Dr Geber has advised that the completion of his analysis and report would be greatly enhanced by, and dependent on, the availability of a basic chronological structure for the burial layers (see Appendix 6).

In the course of screening and examining the cremated bone, additional fragments of artefacts continued to be identified, which indicates that the catalogue of artefacts will not be complete until the entire cremated bone collection has been processed.

### **Radiocarbon dating programme**

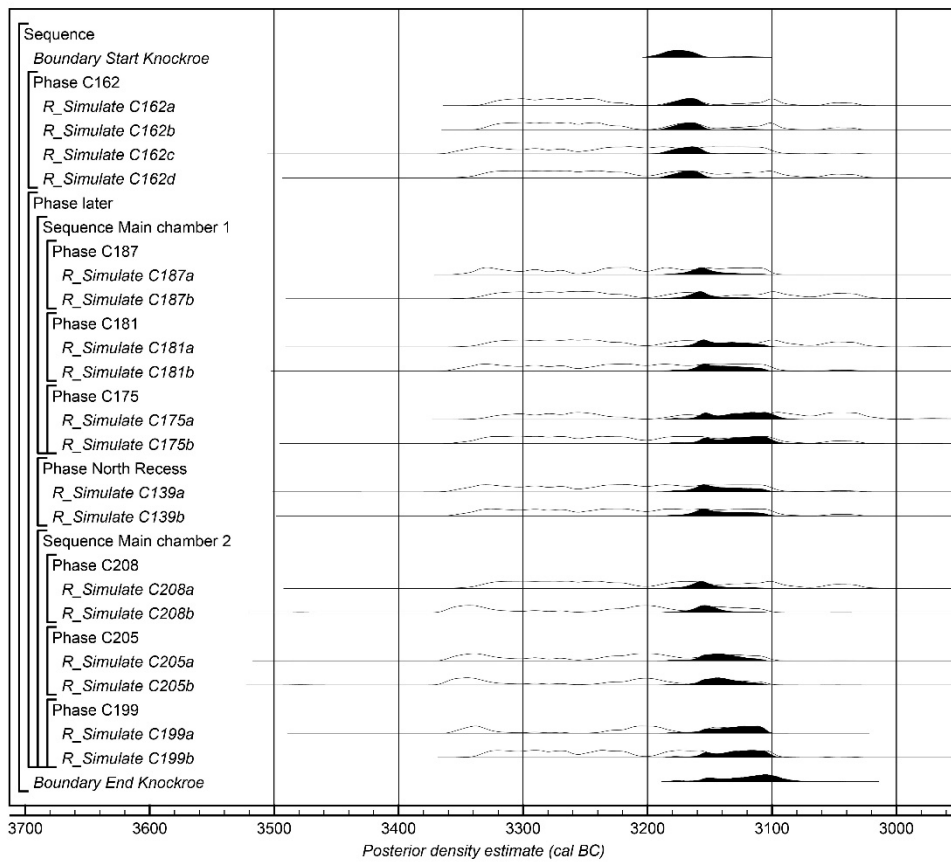
This has been under active consideration throughout the summer of 2021. Specific collections from which samples will be taken are being selected and the types of specimens to be targeted are also being identified. These developments are being shared with Dr. Seren Griffiths, who will conduct the Bayesian analysis of the radiocarbon findings.

An iterative approach to Bayesian model building has been undertaken in line with current best international practice. As part of this process extensive simulation modelling has been undertaken to explore impacts of sample selection on chronology building. The results of one of these simulation models, are seen in Figure 4 below. These can be compared with the extant chronologies associated with passage tomb measurements from Ireland (Figure 5).

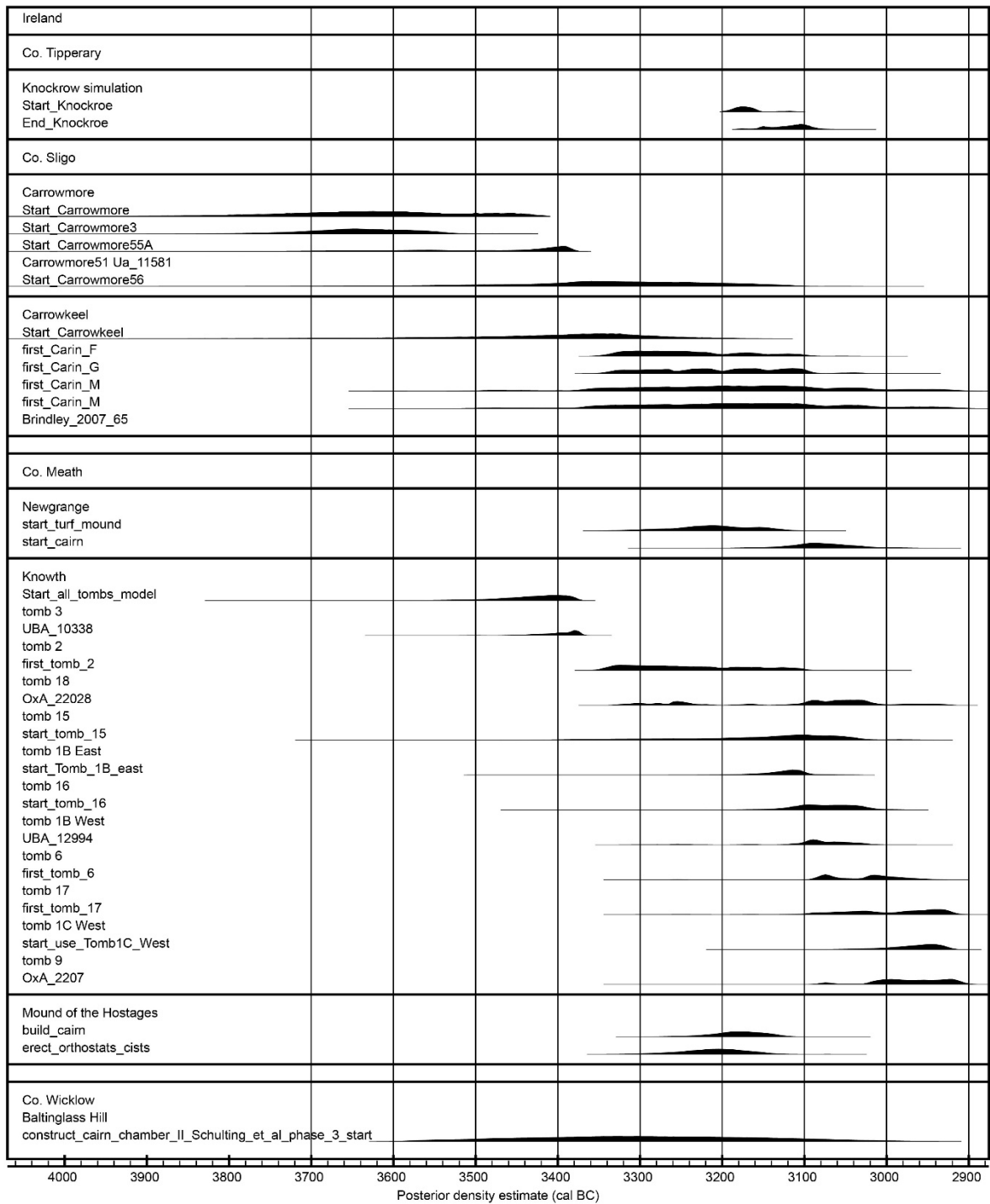
In order to derive maximum value from the radiocarbon dating programme, it is suggested that it be undertaken in two steps: (i) an initial suite of 20 determinations to scope the broad chronological structure of the site, and (ii) a follow-up set of 10 determinations to address issues arising from the first set. As well as responding to the Dr. Geber's recommendation (see above), this is a learning from the Mound of the Hostages radiocarbon dating programme where questions arose from a minority of results, which could have been clarified before publication if provision had been made for dating some additional samples that had been omitted initially.

While the two-step approach suggested here runs counter to a specific condition in the grant, I would hope that some leeway might be allowed given the research advantages to be gained and taking into account both the enormous amount of human bone to be processed and the unique level of fragmentation involved. Subject to receiving the necessary licences, it is suggested that 20 samples chosen from layers already processed by Dr. Geber might be sent for radiocarbon analysis around the end of 2021, leaving a further 10 determinations to be established in time for the final report in October 2022.

Samples will be selected based on suitability of individual elements (size of element, degree of calcined bone, osteological importance and so on), as well as evidence for deposit formation processes and sample taphonomy to ensure that there is a robust association between any radiocarbon measurements and the archaeological events of interest.



**Figure 4:** Simulation model showing the potential chronology of 20 initial measurements on samples from Knockroe.



**Figure 5:** Simulation results from Knockroe compared with other extant results from passage tombs from Ireland.