



Archaeology Research Grant Report

Recipient name:	Dr Neil Carlin
Discipline and subject area:	Archaeology Research Grant
Year awarded:	2023
Title of project:	Let sleeping dogs lie: dating animal bones from inside Newgrange passage tomb

Summary of findings:

From June to November 2023, the Let Sleeping Dogs Lie project team (Neil Carlin, Seren Griffiths, Kate Kanne, Jessica Smyth) investigated how and when the bones of various animals entered the interior of the large Neolithic passage tomb at Newgrange. These had been excavated by O’Kelly during his investigations of the deposits in the chamber and passage during June and July 1967. The sequence of activity within the tomb was very poorly dated and the taphonomy of the deposits was not well understood.

The faunal remains were identified as birds, molluscs, frogs, dogs, hares, rabbits, sheep/goat, cattle, and bats (van Wijngaarden-Bakker 1982, 215). Notably, none of these were considered to be of prehistoric origin (O’Kelly 1982, 107; van Wijngaarden-Bakker 1982, 218). A sample from each of three partial skeletons of large dogs (canids) from the chamber area were selected for radiocarbon dating. Originally it had been planned to obtain three additional dates from other species in the tomb including a hare, a cow and a sheep/goat, but those bones could not be located. Instead, other faunal remains were re-discovered that had never been analysed. These included cattle bone fragments, an unburnt pig tooth, an unburnt bird bone, a hare bone, oyster shell fragments, as well as unburnt large, medium and small mammals. We selected an unburnt cattle humerus fragment and a pig tooth for dating. These five samples from five different animals from the tomb all produced radiocarbon measurements.

The pig tooth dates from 2900-2700 BC, while all the others range from 3300-3000 BC. This reveals that the three Newgrange canids are neither modern nor Iron Age, but instead were deposited at an early stage in the use of the passage tomb.

This provides significant new insights into human-animal relationships in the fourth millennium BC in Ireland, but also raises further questions about the role of animals in society at this time as non-human kin. Based on their exceptional size, it is possible that these canids may well be wolves.

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Please outline the objectives of the project.

The project aimed to clarify the sequence of activity within the interior of the Newgrange passage tomb which is currently very poorly dated and to develop a deeper understanding of the taphonomy of the deposits, which suffered very considerable disturbance prior to the 1967 excavations (O’Kelly 1982). The dogs comprised the partial skeletons of three individuals: one (comprising 27 fragments) from the eastern/righthand recess, one (45



fragments) from the western/lefthand recess chamber and one (44 fragments) from just outside the northern or end recess (van Wijngaarden-Bakker 1982, 215). Van Wijngaarden-Bakker interpreted these as being of recent origin because they were well preserved and had very large shoulder heights of c. 64 cms, compared to Neolithic dogs like the directly dated Later Neolithic example from outside the tomb who tend to be less than 50cms (van Wijngaarden-Bakker 1982, 215; van Wijngaarden-Bakker 1986, Frantz et al. 2016). Indeed, the three dogs are directly comparable to the largest dogs known in Ireland from the early medieval period such as those found at the Knowth (McCormick and Murray 2007, 98-99; McCormick 2007). Although considered to be “stray dogs that were unable to get out of the tomb” (van Wijngaarden-Bakker 1982, 218), their occurrence in or near the three recesses suggests that they may represent deliberate depositions, even though they are considered to post-date the Neolithic.

Significantly, neither the faunal nor human bone assemblage from inside the tomb had been directly dated, except for a now infamous human petrous fragment of the temporal bone (skull fragment) from 3338- 3028 cal BC (OxA-36079: 4473±29 BP) from a male who was the offspring of either full siblings or parent and child (Cassidy et al. 2020).

A key objective was to locate the faunal remains, re-identify them and determine the age of these bones from within these deposits through radiocarbon dating. In particular, we sought to better understand how and when these animal bones, especially the three unusually large dogs from the chamber area, entered the tomb: whether their deposition was related to the use of the tomb in the deep past and how they might inform understandings about activities conducted within its interior.

Another objective was to use these radiocarbon measurements to confirm the excavator’s (O’Kelly 1982, 24-26) conclusion that the interior of the tomb was closed near the end of the fourth millennium BC, before the deposits representing ‘Beaker-period occupation’ began to be formed outside the tomb and had remained hidden until its rediscovery in AD 1699.

Please describe the methodology used in conducting the research.

We extracted all relevant identifying and contextual information for the faunal remains from O’Kelly’s (1982) publication. We supplemented this with additional information from the National Museum of Ireland and the O’Kelly excavation archive held by the National Monuments Service. We, Dr Neil Carlin, Dr Jessica Smyth and Dr Kate



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Kanne (zooarchaeologist), examined the material held in the National Museum of Ireland's repository at Swords, assisted by Matt Seaver, on Thursday 28th June 2023. During this visit, we attempted to match the 1967 faunal assemblage to the identifications in Louise van Wijngaarden-Bakker's (1982) report.

Although the hare, cow and sheep/goat bones could not be located, we identified the remains of all three dogs, including the aspects of the three different partial dog (canid) skeletons, namely the complete left humerus and two left distal humerus fragments. These formed the basis of the original determination that there was a minimum of three dogs in the tomb.

We confirmed that the complete left humerus (labelled Newg. 1A and from Lot 1 in the terminal recess) is from the partial remains of a large dog with a shoulder-height of c. 64 cm, whose vertebrae exhibit signs of incipient spondylosis. We confirmed that the left distal dog humerus, labelled as Newg.5E was found in Lot 5, just outside the Eastern Recess and that the left distal dog humerus which is labelled as Newg. 19C was found in Lot 19, just outside the western Recess. Given that these three left humerus bones are the only definitive ways to ensure we were dating all three individual dogs, we selected all three for dating.

In July 2023, the National Museum of Ireland obtained a box containing burnt and unburnt human and animal bones from inside Newgrange which had formerly been in the UCC Dept of Anatomy. On Wednesday 19th July 2023. Dr Neil Carlin and Dr Erin Crowley-Champoux (zooarchaeologist), examined the newly obtained bones at the National Museum of Ireland (assisted by Matt Seaver) to determine whether any of these newly obtained bones were the missing ones. This box contained burnt and unburnt human and animal bones from inside the tomb. The latter comprised cattle bone fragments including part of a humerus, an unburnt pig tooth, an unburnt bird bone, a hare bone, oyster shell fragments, as well as unburnt large, medium and small mammals (which could not be further identified due to small fragment size). The presence of multiple cattle bone fragments indicated that this assemblage had not previously been analysed by van Wijngaarden-Bakker (1982) who reported only two cattle teeth. We selected a cattle humerus fragment and a pig tooth from this assemblage for dating.

We obtained alter and export licences for all five samples. Prior to dating, we fully photographed, measured, weighed and recorded these using MicroCT scanning, prior to sampling for destructive analysis. We hand-delivered all five bones to the Chrono lab in Queens University Belfast, so that suitable sub-samples for radiocarbon analysis (c. 1g) and the bones returned to the National Museum.

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

All three dogs were located and samples from each returned radiocarbon dates ranging between 3300- 3000 BC. Originally we intended to obtain three more dates from other species including a hare, a cow and a sheep/goat, but those bones could not be located. Fortuitously, an unrecorded assemblage from the 1967 excavations was discovered to comprise burnt and unburnt human and animal bones from inside the tomb. The latter comprised cattle bone fragments including part of a humerus, an unburnt pig tooth, an unburnt bird bone, a hare bone, oyster shell fragments, as well as unburnt large, medium and small mammals (which could not be further identified due to small fragment size).



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From this assemblage, we selected an unburnt cattle humerus fragment (Newg. 5K) from Lot 5 outside the eastern recess and a pig tooth (Newg.3) from Lot 3 at the junction of the passage and chamber for radiocarbon dating. These produced results that range from 3300-3000 BC for the former and 2900-2700 BC for the latter.

The cattle humerus fragment (Newg. 5K) had been found in the same location (Lot 5) as the dog humerus (Newg. 5E) just outside the Eastern Recess. The close match between the radiocarbon measurements from each of these suggests that these bone deposits have considerable chronological integrity. This is borne out by the date ranges from all the other samples which indicates that most of these animals were deposited in the tomb in the latter part of the fourth millennium BC. The pig tooth may date to the beginning of the 3rd millennium which suggests links with some of the animal bones (featuring large numbers of pigs) in deposits outside the tomb.

This reveals that the three Newgrange canids are not modern dogs as originally thought, nor are they Iron Age as suggested elsewhere (Gibbons & Gibbons 2016, 70). Based on their exceptional size, it is possible that these canids may well be wolves.

Our analysis of the body part representation indicates that these canids are likely to have been deposited in the tomb as fully articulated skeletons. Some elements appeared to be from the same dog, based on their size and reasonable possible articulations of normally articulating bones. This is supported by the consistency of the colour, taphonomic state, and degree of fragmentation of these bones which suggests they were all deposited at the same

time. However, there are no photos, drawings or additional information about the canids in the O'Kelly excavation archive to resolve this.

Our results provide significant new insights into human-animal relationships in the fourth millennium BC in Ireland, but also raise further questions about the role of animals in society at this time as non-human kin.

The addition of five new radiocarbon measurements from the deposits inside the tomb (three of which come from probable articulated skeletons which means they have a clear association with their archaeological context) means that there are now six such dates that greatly clarify the chronology of the use of this monument.

Please provide details of the dissemination of the outcomes from this project.

There has been no external dissemination of the project outcomes in the period July to November 2023, as project results are only just emerging. See below for planned dissemination into 2024.

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

An open-access journal article on the results of the project is currently being drafted for Submission to the Proceedings of the Royal Irish Academy (Section C) in January 2024. Once completed, full details of the radiocarbon results will be made widely available – these will also be deposited within the I4C open-access repository. Publicity activities are in train. In advance of the article being published online, details of the project will be sent to the UCD press office which pushes press releases to various channels.



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We plan to present project results at a number of outreach events, e.g. Heritage Week (August 2024) and at various suitable archaeology conferences and seminars such as the annual conference of the European Association of Archaeologists, the Neolithic Studies Group, (theme permitting) the Institute of Archaeologists of Ireland, as well as at the biennial RIA 'Revealing the Past' conference, if requested.

How did the award enhance your professional development?

The project enabled us to address a neglected aspect of what is considered a very well-known site. It has resulted in highly significant findings. It facilitated a mutually beneficial collaboration between the applicant, Neolithic specialist, Dr Jessica Smyth, zooarchaeologist Dr Kate Kanne, and scientific dating specialist Dr Seren Griffiths that has added much value to an older excavation.

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

We will re-examine the partial skeletal remains of the three canids to see if any of their bones may have been conjoined (or if conjoining elements are present) so that we can confirm that their bodies were articulated when deposited. We will also re-examine them to identify differences in the presence of elements from the right and left sides of these individuals that will help to address this question.

We are currently conducting additional research on:

- the deposition of these bones at Newgrange.
- the depositional treatment of animal bones, from other fourth and third-millennium contexts in Ireland and Britain, especially dogs and other assemblages from megalithic tombs.
- the chronology of activities at Newgrange relating to the construction and use of the tomb.

We are exploring using scientific methods such as aDNA to clarify if the Newgrange canids are dogs, wolves or a hybrid of both.