

Archaeology Research Excavation Grant 2022

Richard Jennings_ Final report

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1. Title: Dr

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2. Email:

3. Grant programme Archaeology Research Excavation Grant

4. Year awarded 2022

5. Title of project Castlepook Caves Project

6. Summary of report (Min. allowed 100 words)

This report summarises the results to date of two weeks of fieldwork at Castlepook Cave from May 21st to June 4th 2022. In the first week we completed a drone 3D laser survey of the external cave landscape and an internal LiDAR scan survey of parts of the cave we were about to investigate. We recovered 154 animal bones from 18 contexts during excavation and/or sampling of three main areas of the cave. The assemblage was a mix of Pleistocene and Holocene fauna, four pieces of which we are putting forward for dating. We discovered a charcoal layer in the front entrance chamber beneath a loosely formed stalagmitic floor. We submit three of the charcoal pieces and a hazelnut kernel for dating. The results came back as all of modern age. We reached the lower sand chamber of the cave and took further charcoal samples from an area of sediment collapse. We submitted one piece of charcoal and it returned a Medieval date. We undertook an intensive search for rock art but nothing definitively old was identified. Some line incisions require further study. Ancient DNA and sediment micromorphology analyses are ongoing with no results to report at this point

7. Please provide two appropriate images



9. Please outline the objectives of the project

The discovery of a brown bear bone (patella) that was butchered in the Late Upper Palaeolithic at Alice and Gwendoline Cave, Co Clare (Dowd and Carden, 2016) has energized the search for an Irish Palaeolithic. However, not a single stone or bone tool that can with certainty be said to represent a human

occupation of this island prior to 10,000 cal. BP and thus the origin of human settlement here must remain far from resolved. This discovery makes a compelling case for archaeological excavations at places where Palaeolithic archaeology could be present. We undertook excavations at Ballynamindra Cave from 2014-2018 (Jennings et al in prep) and now propose to explore Castlepook Cave, Co Cork. The main reason for targeting Castlepook Cave is because Dr Ruth Carden recently identified bones with cutmarks from no less than three phases of the last ice age cycle. These bones derived from excavations undertaken in the cave in the early 20th century and constitute the best evidence documented thus far for a Pleistocene hominin presence in Ireland. We intend to look for signs of human occupation such as charcoal, lithics, cave art, and more modified bone. Our research intends to firmly place Ireland on the northwestern margins of Aurigancian, Gravettian, and Late Palaeolithic population movements into Europe and link these to environmental windows of opportunity for when people were able to reach Ireland.

Our strategy for Castlepook Cave fieldwork in 2022 is fourfold. First, we wish to map the cave interior and exterior environments using laser scanning technologies. This will provide us with an excellent digital recording platform and heritage record prior to any excavation work taking place in the cave. The exterior survey strategy, coupled with fieldwalking, is designed to help locate hidden or infilled entrances that otherwise are indistinguishable to the naked eye. One hypothesis we have for the passages of the new section of the cave is that these were also accessible via now blocked entrances. Second, we want to explore the multitude of chambers that were excavated in the early 20th century to see whether we can identify any extant deposits within them. If we locate them, we intend to take new palaeoenvironmental, micromorphological and dating samples, which will help us to align and integrate the archived animal bones held in the National Museum of Ireland with the original field notebook and the laser scanning of the cave system within a GIS system. Third, we wish to excavate and sample up to two test trenches in the relatively unexplored new section of the cave, where sediments and fauna are known to survive. Finally, we wish to use RTI photography to explore the cave walls for traces of rock art.

The improved dating and ancient DNA profiles that will come from the proposed dating and analysis of freshly excavated Pleistocene fauna will also be important in terms of refining the chronology of the last glacial period, which will in turn allow more accurate understanding of the timing of the potential influxes of fauna into Ireland and the presence of land-bridges. It is intriguing that sediments pre-dating the LGM survive in the cave when current glacial ice sheet models indicate that the whole of Ireland was covered in ice sheets. We wish to explore the idea that there was a refugium in Ireland and that the models may be inaccurate. The way to do this is to take new samples in the cave using the latest scientific techniques such as radiocarbon dating with ultrafiltration, and advanced micromorphology procedures to fully begin to understand cave sediment formation. As we know from our research at Ballynamindra Cave, Co. Waterford, this is something that will take intensive and patient research, but with every chance of success.

10. Please describe the methodology used in conducting the research

1. Desk-based research – Studied field notebooks of the historic excavations on site.
2. Bat survey (May 2022) – prior to investigation of the cave, a bat survey was undertaken by Dr Ruth Carden and a derogation licence obtained from National Parks and Wildlife Service.
3. Health and Safety Assessment (May 2022) – Mr Stan Drapala (Speleological Union of Ireland) led an assessment of the cave to ensure it was safe to work. With SUI volunteers they set out safe routes through the cave and set out lighting, and were present for the whole two weeks, contributing immensely to the project.
4. Cave mapping survey (May 21st – May 28th 2022) – Dr Patrick Randolph Quinney and Ms Keziah Warburton undertook a mix of photogrammetry, LiDAR, and 3D laser scanning to map selected chambers of the interior and the exterior cave landscape. Mr Stan Drapala's team used a 3D Leica Disto to map the wider cave. The ongoing goal is to display in 3D the mapped cave in its correct georeferenced position, thereby making it possible to accurately locate potential concealed entrances, which could then be targeted for future geophysical survey and excavation.

5. Fieldwalking survey (May 21st – May 28th 2022) – fields adjacent to the cave were field-walked to look for finds and evidence of infilled cave entrances or sinkholes.
6. Cave rock art survey (May 28th – May 29th 2022) – Cave walls and ceilings were examined by Mr Ken Williams with Reflectance Transformation Imaging (RTI) equipment to search for cave art.
7. Cave excavation 1 (May 28th – June 5th 2022) – Dr Helen Lewis searched for, recorded and sampled extant sediments in selected parts of the cave that was excavated in the early 20th century. Geoarchaeological field recording followed both standard archaeological recording methods for soil and sedimentary contexts (after Hodgson 1997; MoLAS 1994), with an additional focus on geomorphological and preservation/alteration processes involved in creating and changing the sedimentary record in the caves (e.g., Goldberg & Sherwood 2006).
8. Cave excavation 2 (May 28th – June 5th 2022) – Mr Philip Kenny and Ms Keziah Warburton placed up two 1m x 1m test trenches in Upper Bone Passage/Sand Chamber and the Lower Bone Passage in the new part of the cave system discovered in the 1970s by Mr Jerry Aherne, where sediments exist. We laser scanned the area prior to excavation.
9. Sampling – Micromorphology, dating sediment DNA and faunal samples were retained systematically throughout the course of the excavation. Deposits were sieved and a portion wet sieved. Bone or cultural yielding sediments were wet-sieved on site to 100 microns to maximise recovery of micro-fauna and lithic debitage etc.
10. Recording – The locations of faunal remains and samples were recorded on a grid linked to the 3D laser survey. Helen Lewis will record all sediments.

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

A 3D lidar survey was carried out in selected areas of the upper and lower cave systems of Castlepook cave, while other parts of the cave were recorded using a Leica Disto. A DTM of the external cave surface was captured with a drone and currently all of these datasets are being processed with the aim of producing a unique 3D model of the cave and its external surface.

We placed two cuttings in the lower cave system. Cutting 1 was dug in the Lower Bone Passage and measured 0.7m (N-S) x 0.45m (E-W). It was excavated through a series of sand and clay deposits to the sloping stone base of the chamber 0.40m below the chamber floor surface. Cutting 2 in Upper Bone Passage measured 0.75m (NW-SE) x 0.45m and was excavated through a series of sand and clay deposits to the top of the large fallen boulder. Two of these deposits contained occasional lumps of charcoal, one piece of which was submitted for radiocarbon dating and returned a date of 1190 +/- 20 BP. Our preliminary interpretation is that these deposits fell into this part of the cave from a roof collapse.

We successfully located cave sediments for sampling in the upper cave system. Four areas of interest for sampling were located, and three of these were investigated: Entrance Gallery, Elephant Hall, and the passage between them. In the Entrance Gallery, a small 'pit' dug into the current surface was cleaned out and box excavated to explore the remaining deposits; our expectation was that these would be redeposited spoil from earlier excavations, trample and modern rubbish, and washed in sand and/or silt. However, we found a small apparently intact set of layers cut through by the recent pit – a layer of broken speleothem (C.104) over a layer of charcoal (C.118), and we extended the excavation test pit to further expose these deposits, and to sample from them. Radiocarbon dating of three pieces of gorse charcoal and a hazelnut shell from this layer returned modern ages. Analyses of micromorphology and sedimentary DNA samples are ongoing with no results reported at this time.

A small assemblage (n = 154) of a mixture of, assumed, relatively recent and potentially Pleistocene amphibian, birds and mammalian species bones were recovered during our investigations this year. The bones mostly derived from the cave floor surface with some from stratified contexts. This material should be retained for further research, given this is the first season of modern excavations at Castlepook cave.

Cave photography revealed an area of interest on the ceiling of the passage between Wolf Hall and Elephant Hall. On a small area of the surface, a series of

linear incised lines ran in various directions and often crossed other lines. While these could result from simple damage caused by helmets scraping off the surface, the concentrated nature of these lines and the fact that they run in various directions suggests they may have been cut into the surface deliberately. Their antiquity is unclear.

12. 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

At the request of the landowner, we have been discreet with regard to publicising our fieldwork, although that did not stop a steady stream of locals visiting the cave each day. This is the first of many seasons planned at Castlepook so our results are at the early stages. That said, Ruth Carden's forthcoming paper on the human modified reindeer bones will draw upon the 3D mapping work undertaken, and Ruth has promoted our excavations on her Twitter feed, which was retweeted by the Royal Irish Academy.

b) No. of Academic Papers/articles published:

0

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

0

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

Once the specialist analyses are all completed, including the integration of the cave internal and external 3D environments, we will be in a stronger position to promote our results. The forthcoming paper on the human-modified bones from Castlepook Cave (submission plan June 2023) will generate considerably publicity. One talk is forthcoming to Cork Speleological Union of Ireland talk series in Doneraile, Dec 1st.

How did the grant enhance your professional development?

Considerably and hugely appreciated. The grant money I apply for may not be substantial but it enables research teams to form with those specialists bringing their expertise mostly at no cost. This means the project can achieve goals well above what they would be if full economically costed. Bringing in external funding is a great box to tick in terms of career development, and I have no doubt contributed to getting a promotion at work. Last year I contributed to a publication in Nature based on the research that I did for the previous RIA award for Ballynamintra Cave.

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

I have applied again for the 2023 archaeological research grant application. Please see my proposal where we set out our plans to apply geophysical survey techniques to located inlled entrances at Castlepook Cave, and to undertake eldwork at a largely unexcavated site in the same valley – Kilcolman Cave.

opportunities, opportunities for enhancing skills, collaborations with others etc.)?

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