Acadamh Ríoga na hÉireann
Royal Irish Academy

1. Title:	Dr
First name:	Marion
Surname:	Dowd
Amount awarded:	€10680
3. Grant programme	Archaeology Research Excavation Grant
4. Year awarded	2019
5. Title of project	Alice and Gwendoline Cave: assessing an Upper Palaeolithic site
6. Summary of report (Min. allowed 100 words)	The objective of the 2019 research excavation at Alice and Gwendoline Cave was to investigate the archaeological context of an Upper Palaeolithic butchered bear patella that was recovered at the site in 1902. A series of soil samples and sedimentary blocks were taken to conduct lipid biomarker characterisation with compound specific carbon and hydrogen isotope analysis, soil micromorphology, and phytolith analysis. A small quantity of animal bone was recovered, in addition to a series of possibly struck lithics. Two areas of in situ burning that had been identified by magnetic susceptibility in advance of the project were investigated during the excavation.
7. Date the report was submitted	25-10-2019
8. Please provide two appropriate images which can include photographs of team on site, aerial view, objects found during excavation etc and which can be used by the RIA in grant publications, website etc.The following file types are accepted: gif, jpeg, jpg, pdf, png and the image must be high quality (at least 1200x1800 pixels).	 Excavation shot, Credit Thorsten Kahlert.jpg

Recording in cave, Credit Thorsten Kahlert.jpg

9. Please outline the objectives of the project

1. To investigate the archaeological context and environmental conditions of the Upper Palaeolithic butchered bear patella and other extinct faunal remains that were discovered in Alice and Gwendoline Cave in 1902.
2. To recover suitable sedimentary blocks and soil samples to allow for lipid biomarker characterisation with compound specific carbon and hydrogen isotope analysis, soil micromorphology, and phytolith analysis.
3. To establish the extent of in situ deposits within the cave and to assess the extent of the 1902 investigations.
4. To carry out a detailed survey and 3D laser scan of the cave, to replace the 1902 survey of the site.
5. To capture the immediate landscape through drone photography.
6. To conduct a geophysical survey in the main cave passage.

10. Please describe the methodology used in conducting the research	1. Geophysical surveys of the Alice passage used magnetic susceptibility (two independent surveys at 1cm and 15cm depth penetration), magnetometry, earth resistance and metal detection. The magnetic susceptibility survey obtained the most useful data which highlighted areas of in situ burning, and specifically two areas in Trench 2. 2. Licensed metal detecting was conducted through the Alice passage to identify areas of metal finds. 3. The entire cave interior and exterior were surveyed using a 3D laser scanner. A new ground plan was extracted from this data, combined with Total Station survey data. 4. Two trenches – Trench 1 (4m x 1m) and Trench 2 (2m x 2m) – were opened in the Alice passage of Alice and Gwendoline Cave. Both trenches were excavated by grid (each typically 0.50m x 0.50m), stratigraphically, and by single context. Each context was recorded by context sheet, photographed, and planned where relevant. All excavated deposits were dry-sieved outside the cave through sieves with a 3mm diameter mesh. All artefacts, bone, charcoal and land-snail shells were collected and given sample numbers, as were select bulk soil samples. Artefacts and possible artefacts were given find numbers, and individually bagged. 5. Two micromorphology samples and six phytolith samples were taken from Trench 1, and six micromorphology samples, one lipid biomarker sample and seven phytolith samples were taken from Trench 2 with the objective of carrying out lipid biomarker characterisation with compound specific carbon and hydrogen isotope analysis, soil micromorphology, and phytolith analysis.
11. Please outline the findings of your research and/or milestones achieved	1. The 2019 excavation in Alice and Gwendoline Cave succeeded in establishing the extent of the 1902 excavations. Colour changes visible on various areas of the cave walls indicated the level of the cave floor prior to the 1902 excavation: essentially 0.60-0.75m above the current floor level in the Alice passage. It is now also clear that the 1902 excavation was incredibly thorough with very few areas of this upper 0.75m of intact deposit surviving. Traces of the 1902 excavation were noted: a 60ft mark in red paint on the cave wall to the east of Trench 1, a swastika carved into the western cave wall to the south of Trench 2 – a symbol Thomas J. Westropp frequently added to his illustrations; and fragments of glass bottles that may relate to the 1902 investigation. 2. The 2019 excavation in Trench 2 was of deposits the occurred beneath the level of the 1902 excavation – these layers appear to have been in situ and not disturbed or investigated during the antiquarian dig. 3. Soil micromorphology, lipid biomarker and phytolith analyses will take place in the coming months to establish the environment in and around the cave in the late Upper Palaeolithic. 4. A detailed 3D scan of the cave has been completed allowing interrogation of the cave and a ‘walk-through’ perspective. 5. The first modern and accurate survey of the cave floor plan has now been completed. 6. We await radiocarbon dating, animal bone analysis and lithic analysis in the coming months.

12. Dissemination of outcomes:

The results of analyses have not yet come through and thus we have not yet disseminated anything about the excavation.

All specialist analyses and radiocarbon dates should be completed and returned by early 2020. At that point, at least three different academic papers in peer-reviewed journals are anticipated with the following foci in relation to the 2019 work at Alice and Gwendoline Cave: geomorphology; geophysics and prospection; and the contribution of the 2019 excavation to understanding Ireland's Upper Palaeolithic period.

This was my first time working with the soil micromorphology and related scientific soil analysis techniques, which I will definitely use in any further cave research projects. Likewise, this was my first experience of 3D cave surveying and will be used in all future projects directed by me.