IQUA
Irish Quaternary Association
Cumann Ré Cheathartha na h-Éireann

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Editor: Ellen OCarroll http://www.iqua.ie

1. Introduction

Dear IQUA member,

Welcome to IQUA newsletter No. 58.

It was with much sadness when the death of three esteemed Quaternary members was announced over the last year. Valerie Hall, Peter Woodman and Keith Barber will be greatly missed by the Quaternary community. Three fitting tributes on their life's work, influences and friendships are detailed in this newsletter.

Also included in this issue are abstracts from conferences and field trips and information on upcoming events. Our very successful field trip to the Burren in Clare is summarised in Section 4. The weather was incredible, the views were stunning and the Quaternary discussions and archaeological sites visited made for a fantastic weekend. Thanks to Chris Randolph, Joanna Nolan, Damhnait Ni Maoldaoin and the rest of the Galway Geological Association (GGA) for organising such a superb trip and programme.

The 2016 IQUA symposium theme was *"Early Human Occupation in Ireland"* and the event was held in the Geological Survey of Ireland on Friday the 25th of November. The symposium featured a range of speakers from Ireland and the UK covering various aspects of early human occupation including the Palaeolithic, Mesolithic, Neolithic, genetics, early flora, landbridges, early landscapes, submerged landscapes as well as new information from old bones! Abstracts for these exciting talks can be read in Item 5 of the newsletter. IQUA would like to thank the GSI for the use of their facilities once again. Wine, beer and pizzas were enjoyed by all after the symposium.

We hope you will join us for events during the year. There is currently a call for papers for the upcoming Spring Meeting and AGM (Saturday 22nd of April) – see Item 3 for details. The Spring Meeting will be hosted by Steve Davis at University College Dublin We hope you can all attend this event.

Finally, thanks to all who contributed to this edition of the newsletter.

Kind regards,

Ellen OCarroll, February 2017

2. IQUA Committee (2016/2017)

President: Dr Catherine Dalton, MIC, University of Limerick
Secretary: Dr Benjamin Thebaudeau, NUI Galway
Treasurer: Dr Kieran Craven, Geological Survey of Ireland, Beggar's Bush, Haddington Rd, Dublin 4,
Postgraduate rep: Margaret Brown, MIC, University of Limerick
Website manager: Chris Randolph
Publications Secretary: Sabrina Renken, Department of Geography, TCD
Newsletter editor: Dr Ellen OCarroll
Ordinary members: Dr Steve Davis, UCD, Dr Rory Flood, QUB, Martha Coleman, Maynooth University, Darren Barry, MIC, University of Limerick, Dr. Sara Benetti, University of Coleraine, Dr. Frank Ludlow, TCD.

3. IQUA Spring Meeting and AGM 2017

We are pleased to announce that the 2017 IQUA Spring Meeting and AGM will be hosted by the School of Archaeology in UCD on **Saturday the 22nd of April** at the Ardmore Annexe, Belfield, Dublin.

The meeting is open to all and will consist of short (20 mins) presentations on any area of new or ongoing Quaternary research. Postgraduate and post-doc students are especially welcome and are encouraged to take advantage of the opportunity to present in an informal and friendly setting. Both oral and poster presentations are invited and there will be a prize for best postgraduate talk. Please send abstracts of c. 200 words to: Steve Davis (stephen.davis@ucd.ie), indicating if poster or talk.

DEADLINE: March 31st.

The meeting will be followed by the IQUA AGM on the Saturday afternoon.

There will be a small fee to pay to cover some of the expenses related to the meeting and to support further IQUA activities. The fee will be €10/€5 for members and students/concessions respectively or €20 for non-members.
Registration will commence at 9:30am.

The Secretary (email: thebaudb@tcd.ie) welcomes suggestions for Agenda Items up to Friday 21st April 2017 for the IQUA AGM. The agenda will be circulated before the meeting, and will include nominations for the Committee. Nominations can be made up to the start of the AGM. We would also love to hear proposals for a location and organiser for the next Field Trip and a theme for the Symposium for Autumn 2016.

More details on the venue location or for submitting an abstract are available on the IQUA Meetings webpage.

We look forward to seeing you in UCD, Dublin

4. IQUA/GGA 2016 Annual Fieldtrip

IQUA/GGA Fieldtrip the Burren, 30th Sept –2nd October 2016.

Catherine Dalton
(IQUA Chairperson)

Chris Randolph and Joanna Nolan

Reconstructing the Burren Landscape

Over the course of the first weekend in October, thirty-seven intrepid landscape enthusiasts traversed the Burren as part of the annual Irish Quaternary Association fieldtrip. The group consisted of amateurs, professionals, academics and students, all passionate about ancient landscape histories. This year, the fieldtrip was organized by members of the Galway Geological Association.

On Friday evening we had two introductory talks. Maria Long gave a very well-illustrated taste of the flora that we would miss due to our visit being outside the flowering season, and included a few challenges to look out for in the course of our trip! She described The Burren habitat; a combination of unique factors such as geology and land use history, which combined to generate this unique landscape where varieties of flora, normally restricted in their distribution, occupy or share uncharacteristic habitats. It is also notable for the abundance of its plant species.

Since we were meeting in Gort it seemed only fitting that Professor Pete Coxon (Trinity College Dublin) should describe the inter-glacial deposits found along the Boleyneendoorish River, northwest of Gort, examined first in 1865 by G.H. Kinahan, a geologist with the Geological Survey of Ireland. Based on preserved vegetation which fell into the lake and became buried in the lake bed, Kinahan was able to infer that the area experienced a warm (inter-glacial) period sandwiched between periods of much colder, vegetation-free conditions (glacial). Kinahan's report included plant analysis by Professor Melville MD who stated:

"I have examined the collection of specimens from the lacustrine [lake] deposit. The important part consists of cones of the Scotch fir and of the common spruce; the remainder of fragments of wood chiefly coniferous, portions of branches, scales of bark, pieces of fir bark, and a single imperfect hazel nut."

Which can't help but raise images of an animated, sabre-toothed squirrel chasing a hazelnut into the ice-age! This warmer period became known as the 'Gortian' in Ireland. Negatives of the 1935 excavation on glass plates were recently rediscovered in Trinity College Dublin and include that below with the local man who did all the digging!

The dark fossil-rich, interglacial deposits beneath paler glacial deposits.
Local excavator on right.

The deposits were subsequently excavated in 1935 by Jessen, Andersen and Farrington with the assistance of Frank Mitchell who was the source of the old photos; a lovely window onto the fieldwork for this seminal research.

Turlough hill

On Saturday morning the group climbed - and occasionally scrambled - up Turlough Hill with its spectacular views across Galway Bay to look at the large, straight-sided summit cairn and hear from Ros Ó'Maoldúin (NUI Galway) about the enigmatic labyrinthine enclosure and c. 160 stone hut foundations. En route Maria Long (Ecologist) built on her talk of the previous evening by discussing examples of the Burren's unique plant biodiversity and changing botanical landscape as a result of changes in farming, land abandonment and climate change and the challenge of keeping the Burren a living landscape – one vibrant with human, plant and wild animal life.

Turlough Hill

In the afternoon David Drew and Colin Bunce (Burren Outdoor Education Centre) led the group around the Carran and Kilcorney-Meggagh depression, a mysterious area of some 16 km^2 enclosed by the 140 m contour which poses many interesting questions about its formation and drainage – important issues which are directly relevant to the recent groundwater flooding in Roscommon._We then went to the nearby NUIG research station where Michael Lynch showed us some of the finds from his excavations at two Mesolithic sites at Fanore beach. It was a great opportunity to get close-up to these important assemblages and it set the scene for the following days' site visit.

Last but not least, Jenni Roche (Dublin Bay Biosphere Partnership) described the dynamics and longevity of Scots Pine trees found at Rockforest Lough which suggest that Scots Pine could have survived in the forest for the last 6000 years (the longest existence of this tree anywhere in Ireland!). The talk was fittingly framed by a spectacular sun-set.

Poulnabrone Portal Tomb

On Sunday the group visited a very evocative, mist-shrouded Poulnabrone Portal Tomb with talks from Joanna Nolan (Archaeologist), Maria Long and David Drew. This iconic megalithic monument was excavated in 1986 and 1988 by Anne Lynch and re analysed for publication in 2014. Excavated bone fragments suggest burials of at least 19 adults and 17 children, while a further 42 artefacts and 126 pottery shards were recovered. Maria described the environmental conditions reflected by snail populations which she identified in soil samples from the excavation. David showed us that specific faces of the slabs making up the tomb had been selected to face inward or outward depending on which part of the tomb they formed. These were intriguing insights into the context of the monument and even the activities of its builders. Both of their researches are published in the Poulnabrone monograph (Lynch 2014)

The Mesolithic shell midden sites in Fanore More were the next stop with archaeologist Michael Lynch to visit the areas where the artefacts previously viewed had been excavated. These sites found directly above the bedrock and beneath beach deposits confirm that the middens existed before the modern beach. Excavations revealed a stone axe and large quantities of shale, chert and sandstone flakes suggesting that the people who lived here were manufacturing axes as well as harvesting shellfish. Although the site itself has not survived it was possible to discuss its situation in relation to sea level and aspects of the local stratigraphy relating to the site. The final stop of the day was Poulsallagh Bay where Mike Simms (National Museums, Northern Ireland) and Eamon Doyle (Burren Geopark) outlined the geological and Quaternary history of the Burren. Poulsallagh Bay appears to represent the seaward end of a shallow valley extending inland for a kilometre, much of which is overlain by glacial debris. Various glacial features such as a stepped profile, plucked limestone blocks, poorly sorted clay-boulder matrix and glacial striations can be seen here.

A really fascinating and enjoyable weekend generated many questions and fond memories that will keep participants occupied over the course of the coming winter months.
The organisers are extremely grateful to all the speakers for their excellent contributions which made for such great field visits. The guest speakers also contributed articles for a field guide, totaling 80 pages (Nolan J & Randolph C (2016) The Burren Co. Clare. Irish Quaternary Association Fieldguide No. 33). Print (€9) and pdf (€4) copies of this and guides from previous excursions may be purchased on the IQUA website at http://www.iqua.ie/Publications.html

The group at Poulsallagh Bay

Acknowledgements

A big thank you for the tireless work of Chris Randolph, Joanna Nolan, Damhnait Ni Maoldaoin and the rest of the Galway Geological Association (GGA) for organising such a superb trip and programme. Thanks to all the contributors to the field guide.

References

Lynch, A., 2014. *Poulnabrone: An early Neolithic portal tomb in Ireland*.

Randolph, C & Nolan, J. 2016. *The Burren, Co. Clare*. IQUA field guide, 33.

5. IQUA 2016 Autumn Symposium

Early Human Occupation of Ireland

Friday 25th November 2015

Abstracts:

KEYNOTE TALK:

Keynote:

The search for the Palaeolithic in Ireland: a review of current evidence

Dr. Richard Jennings

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The reporting by Dowd and Carden in 2016 of cut-marks on the patella bone of a brown bear found during excavations in 1902-3 at Alice and Gwendoline Cave, Co Clare, sheds new light on the human occupation of Ireland during the Pleistocene. The bone dates to c. 12.8 to 12.6 thousand years BP, which places it in the first half of the Younger Dryas stadial. In light of this discovery and of other ongoing research projects in Ireland, it is timely to take this opportunity to review the evidence for an Irish Palaeolithic.

The review begins not in Ireland but in Britain and mainland Europe, where new discoveries and revisions of existing collections are providing a clearer picture of the movement of human populations into Europe over the last 1.8 million years. Three phases of the Ancient Human Occupation of Britain (AHOB) project (2001-2012) in particular provide us with updated chronologies for the movements of people in Britain. Some of these episodes correspond to environmentally favourable periods in the past when Britain was connected to mainland Europe. AHOB research did not focus on the possibility of landbridges existing between Britain and Ireland, but advances have been made separately in this field over the last decade in Irish Quaternary research and will be discussed here.

This review turns next to Ireland and the presentation of the preliminary results of new research undertaken at Ballynamintra Cave, Co. Waterford, as part of the Dungarvan Valley Caves Project (PI's: O'Drisceoil and Jennings. Funding: Irish Heritage Council 2008 and the Royal Irish Academy 2014, 2015). Ballynamintra Cave was excavated in the 1870s by Adams and yielded a wealth of Pleistocene fauna and some Holocene-age artefacts and human remains. Our research in 2014 demonstrated that Pleistocene deposits survive in the cave interior and were not excavated in their entirety in the nineteenth century, as was the case for many antiquarian cave excavations in Ireland and Britain. Furthermore, in 2015 we discovered that extensive Pleistocene deposits exist outside of the current cave entrance. Both sets of deposits are providing us with a unique opportunity to undertake a range scientific analyses that will enable correlations with the research output of the AHOB project. This will help to clarify the windows of opportunity for when people potentially reached Ireland. Our discoveries cover multiple phases of the Pleistocene and include potential terrestrial climate records from cave stalagmites for the penultimate and last interglacials, Ursus arctus (brown bear) teeth from potential middle last glacial deposits, and Megaloceros giganteus (giant deer) from late glacial interstadial deposits. More significantly, future excavations may yield direct occupation evidence, especially as some of the cave deposits are coeval in age with the bear patella from Alice and Gwendoline Cave. These are exciting times to be searching for Palaeolithic archaeology in Ireland.

Ancient genomics and the peopling of Ireland

Prof. Daniel Bradley
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Instead of extrapolating the past from modern genetic variation, it is now possible to directly analyse whole genomes from the past using ancient DNA analysis of archaeological bones. Work on ancient Irish human genomes in Trinity College is giving new information on from where and when our ancestors came to this island thousands of years ago and also tells us something about their genetic character and how it compares to that of our modern peoples. Two principal horizons of cultural change, the onsets of the Neolithic and Bronze Age, both seem tied to evidence of massive migration; it is clear that the great waves of population change that affected the European mainland washed all the way to the shores of this island.

New evidence from old bones

Dr. Ruth Carden
Independent researcher
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From the 1850s to the mid-1930s, 34 cave sites in Ireland were extensively explored and excavated. The excavations were led by the leading scholars of that time (e.g. Adams, Plunkett, Ussher and Scharff). At least 11 of these caves have evidence of human remains and/or cultural use in conjunction with the presence of animal remains. From the original published records it is estimated that more than 300,000 vertebrate bone fragments and artefacts were recovered from these cave sites and the majority of this material is archived within the National Museum of Ireland collections. The animal bones were identified post-excavation by NMI staff and other leading experts in Britain at that time and these original identifications and listings still influence contemporary histories of the vertebrate fauna of Ireland and indeed conservation policy in terms of priority of perceived native species.
The mid 1990s Irish Quaternary Fauna Project (IQFP; Woodman et al. 1997) dated 64 bones from various caves, thereby establishing chronologies of the presence/absence of particular vertebrates and allowing better assessment of inferred environmental and ancient climatic changes. Subsequently, many scientific researchers have used the IQFP dated bones to extract ancient DNA (aDNA) to determine origins, colonisation events and species-specific relationships in phylogeography studies.

However, there are numerous species' misidentifications of the bone fragments, as per original listings, as well as large volumes of identifiable fragments which were unidentified. Since animal bones are part of the palaeontological and archaeological records, it is vital that their identifications are correct. This research set out to critically re-examine the vertebrate cave assemblages and (re)identify and analyse all of the faunal remains, in conjunction with the potential reconstruction of contextual/other information based on the excavation notebooks and several specific research projects have developed. Results thus far indicate that these faunal records can still provide crucial and salient insights to our understanding of human presence and human-animal relationships.

The flora of the early Holocene and its potential resources for settlers

Dr. Bettina Stefanini
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The conditions that made up the environmental envelope in which early Holocene ecosystems developed, can be traced - partially at least - through proxies. Beetle assemblages with well-defined thermal requirements and chironomids that indicate average July temperatures only slightly below current values provide a good insight into those early environmental conditions (Coope et al., 1998; van Asch and Hoek, 2012). Models of rising sea level show that Ireland had become an island long before the start of the Holocene (Edwards and Brooks, 2008). The route to colonisation for most of Ireland's flora therefore involved crossing open water and consequently limited the number of eventual arrivals to about 70% of those growing in Britain. Mentally stripping away the fens and bogs from the modern landscape reveals an extensive network of shallow lakes and waterways between the debris dumped by the retreating ice.

This then is the blueprint of the early Holocene landscape that we can model and drape with rapidly recolonising pioneer species on slowly developing and at first skeletal soils. Dozens of pollen sequences detail the expansion of trees, shrubs and some herbs across the island (Mitchell et al., 2013). The pollen of these early colonising species provides a sketchy picture of Ireland's woodlands at the time when the first Mesolithic settlers reached these shores. The 'pollen derived' outline can be fleshed out somewhat by including archaeological finds of charred and fresh plant material left behind by Mesolithic people (Woodman, 2015). The first settlers used plant resources to build boats and traps, to haft tools, as fuel, for clothing and food sources. There is even tentative evidence for early human manipulation of their environmental niche (Warren et al., 2013). But all of this evidence falls well short of a full appraisal of the plant resources early settlers had at their disposal.

I argue that we can do better. Irish biogeography places arctic alpine survivors cheek by jowl with Mediterranean species. A plausible case can be made for an early immigration of the latter (Webb, 1983). Given that these rare plants survived in suboptimal environmental conditions, it is plausible that many other species considered native also grew in early Holocene Ireland. A recent ethnobotanical catalogue lists past use of 490 of the

925 species considered native to the Irish flora (Wyse Jackson, 2014). Since Mesolithic people depended on their environment in a more direct way than later inhabitants, we should be tempted to assume they used plant resources far more extensively than we have evidence for.

Sea levels, palaeogeographies and landbridges: swapping ancient myths for modern ones?

Dr. Robin Edwards
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When, where, and if Ireland was once physically connected to Britain and Europe are long-standing questions of popular and professional interest. In the context of this meeting, the existence or otherwise of a landbridge has important implications for understanding how early humans may first have come to Ireland and what kinds of flora and fauna they may have encountered (or indeed, brought with them).

In this presentation, I will briefly review the development of Irish palaeogeographies and outline how sea level data and geophysical modelling underpin them. In addition to summarising the current state of knowledge, I will evaluate the uncertainties associated with these data and modelling approaches, before concluding with potential avenues for future work.

Submerged prehistoric landscapes of Ireland: current investigation and future potential

Dr. Kieran Westley

School of Geography and Environmental Science, Ulster University
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The human occupation of Ireland begins in the early Mesolithic period; between c. 10,000-9,000 years ago. At this point in time, relative sea-level (RSL) around the island of Ireland was rapidly changing in a spatially and temporally complex manner. This was a legacy of isostatic adjustment of the Earth's crust stemming from removal of the ice sheet which covered the island during the Last Glacial. Consequently, coastal areas favoured by its earliest inhabitants are now submerged by anywhere between 5 to 40 metres below present sea-level depending on local patterns of RSL change.

This presentation will outline the current state of research being undertaken in Ireland to firstly reconstruct these submerged archaeological landscapes and secondly identify prehistoric archaeological material on the seabed. The first approach takes advantage of high-resolution marine geophysical datasets acquired within the past decade, principally multibeam echo-sounder and sub-bottom profiler. The second approach, while aided by such data, also relies on survey and test excavation by diving archaeologists.

The geophysical data have been examined for evidence of past sea-level change and formerly sub-aerial landscapes and, in conjunction with extant sea-level models, have been used to produce time-stepped palaeo-geographic reconstructions. These in turn have aided the identification of submerged palaeo-landscape features including layers of peat buried in the intertidal and subtidal zones. The diving investigations have also identified fragments of preserved landscape, again in the form of submerged peat, and for the first time in an Irish context, conducted test excavation of a submerged Mesolithic site. Although this work is still largely in its infancy, especially when compared to other parts of NW Europe and the British Isles, it is hoped that it will eventually obtain new archaeological and palaeo-environmental evidence that can shed light on Ireland's earliest colonists and their interaction with changing landscapes of the early Holocene.

Future possibilities for the Mesolithic of Ireland

Dr. Graeme Warren

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This paper offers a brief overview of current understandings of the Mesolithic period in Ireland, set into a comparative European context. The Mesolithic period sees the first substantial evidence for the human settlement of the Irish landscape including large scale human modifications of the environment. The Mesolithic of Ireland is characterised by some well recognised distinctive and unusual features when compared to its European neighbours. Many similarities also exist and are sometimes less well understood. This paper will also address how our understandings of the Irish Mesolithic might develop in the context of broader European Mesolithic scholarship.

Farmers, foragers and packages: working through the adoption of farming in Ireland

Dr. Jessica Smyth

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Our appreciation of the arrival of farming on the island of Ireland continues to evolve. Systematic and extensive programmes of radiocarbon dating and formal chronological modelling in a Bayesian statistical framework have provided us with a sense of the timings and rhythms of early 4th millennium BC activity (Whittle et al. 2011; Schulting et al. 2012; McLoughlin et al. 2016), while the large amounts of settlement data recovered from developer-funded excavation (Smyth 2014) and ongoing research into plant and animal husbandry (McClatchie et al. 2014; Smyth and Evershed 2015) are giving us a much clearer view of what early farming – things and practices– looked like. Some of this resembles what is happening in Britain and on the European continent, but other elements are different. Perhaps obvious, but frequently glossed over, is the fact that the character of the Neolithic that emerges in Ireland (as in any region) is dependent on the specific networks or 'landscapes of action' that existed across forager-farmer worlds (e.g. Barrett 2011; Robb 2013). This paper explores why the Irish Neolithic has the features it has and what this tells us about how and why the shift to farming occurred.

INQUA LOC presentation:

Engaging with the media: keeping everyone happy

Thomas Deane

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mathematics and science,
Trinity College Dublin
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It is becoming increasingly important to communicate scientific research with the wider world, but keeping everyone happy from researchers to journalists and editors can be challenging. In this talk I will discuss how best to engage members of the media via press releases and pitches, prepare adequately for the subsequent interest and dissemination of your research, and develop effective interview skills to ensure an accurate but layman-friendly message comes across.

6. Bill Watts 14CHRONO AWARDS & IQUA Research awards

We are pleased to announce the winners of the **IQUA Research Awards** and the **Bill Watts 14CHRONO Awards** 2016 as well as detail on some of the research that the awards has gone on to fund. The awards are open to all paid-up IQUA members of at least one year's standing. They consist of four AMS radiocarbon dates sponsored by the 14CHRONO Centre of Queen's University Belfast and an additional IQUA grant designed to fund a further two radiocarbon dates, but which can alternatively cover other dating methods or laboratory fees (e.g. for DNA or isotope analyses).

The **Bill Watts 14CHRONO Awards** pay for six AMS radiocarbon dates for current postgraduate members of IQUA. Winners of the Awards are asked to present their research and the use of their awarded AMS^{14}C dates at the Spring Meeting and to include their abstract in the IQUA Newsletter.

Winners of the 2015 Bill Watts 14CHRONO Awards were Ciara Fleming, UCD (3 dates) and Alwynne McGeever, TCD (2 dates).

The research awards went to: Pete Coxon and Trevor Northage, TCD (2 dates) and Eugene Farrell, NUIG (1 date).

Congratulations to all who received the awards and we look forward to hearing about their research in upcoming newsletters. Below is the detail of Dr. Eugene Farrell research award.

IQUA Research Awards – abstract

Dr Eugene Farrell
Geography Department
National University of Ireland Galway

Dating a sample from a pine tree exposed after the Winter 2013-2014 storms in Castlegregory Co. Kerry.

Geographical details incl. co-ordinates: Castlegregory Beach, 52° 15' 37", 10° 00' 49"
Dated: Pine stump removed from base of tree
^{14}C lab. no. for the date: UBA-33803
^{14}C date: 4466±33 BP
2 σ cal. age range: BC 3338- 3206

Summary and Conclusions: Coastal erosion from the Winter 2013-2014 storms was very extensive and exposed the remnants of buried mid-Holocene forests not seen previously. Prof Mike Williams reported of drowned mid-Holocene landscapes in a recent publication in the Irish Journal of Earth Sciences based on similarly exposed forests in north Galway Bay (C14 BP 6499±24 (pine stump @ +2.0), 2053±19 (birch stump @ -1m) and 5400±25 (oak stump @ -1.0m) 5400±).

Funding provided by IQUA Research Award

7. Quaternary News and Events

Dr. Michael Philcox

Irish Geoscience Network

Lifetime Achievement Award

Martha Coleman

On October 21st an event was held at the Royal Irish Academy (Dublin) in celebration of geologist Dr. Michael Philcox. Members from the academic and industry institutes of Ireland attended this memorable day to recognise Michael's remarkable contribution to our knowledge of Geology and the Quaternary. The event, a surprise to his family, was also attended by his wife Essen and children Cengiz and Lia. Hailing from Kent, Michael's career spans from his entrance to Trinity College Dublin in the 1950s and continues today where he remains an important key figure in our understanding of Irish geology.

The day began with an introduction and welcome by the President of the Institute of Geologists, Marie Fleming. Talks were delivered by friends and colleagues, all of whom provided personal anecdotes on meeting and working with Dr. Philcox. Prof. George Sevastopulo of Trinity College Dublin spoke of Michael's early career and his contribution to our knowledge of Ireland's Carboniferous geology. Sean Finlay of Geoscience Ireland spoke of when he first met Michael in 1971. Sean was an enthusiastic apprentice with Michael as his 'Mentor Extraordinaire'. He discussed Michael's contribution to geological humour while also praising his willing ability to teach.

The group then heard from Dr. Robert Blakeman, Senior Exploration Geologist at New Boliden Tara Mines. Michael's extensive development of the local Navan stratigraphy was outlined. His definitive distinction of the Navan's 'Shaly Pales' unit was also noted while Robert expressed his hope of Michael's continued role at New Boliden Tara Mines. The final talk of the day was given by Prof. Colm Ó Cofaigh of Durham University, who gave a personal account of Michael's helpful input during his time as a Trinity undergraduate while also discussing his contribution to Quaternary studies in Ireland.

Presentations were made to Michael during a reception held following the talks at the Royal Irish Academy. Jim Geraghty from New Boliden Tara Mines presented Michael with a framed cross section of the Navan orebody (by Michael himself). Before presenting Michael with a sculpture on behalf of The Irish Geoscience Network, Prof. Peter Coxon gave a speech on Michael's vital efforts and invaluable support to the Irish Quaternary Association. Michael also received a bound compendium of his published work from Gareth Ll Jones, which was given to all attendees on USB sticks. Mike Lowther presented Michael with a Miner's Safety Lamp on behalf of The Irish Mining Industry. The day ended with the group making their way to the Alexander Hotel for a celebratory dinner.

The event was sponsored by New Boliden Tara Mines Ltd., Roadstone, The Exploration and Mining Division and Geological Survey of the Department of Communications, Climate Action and Environment as well as the association sponsors – the Institute of Geologists of Ireland, the Irish Association for Economic Geology, the Irish Quaternary Association and the Geothermal Association of Ireland and Trinity College Dublin.

The event was organised by the Irish Geoscience Network whose organising committee consisted of Gerry Stanley, Gareth Ll Jones, Bettina Stefanini, Marie Fleming, Peter Coxon, Catherine Dalton, Eibhlin Doyle, Matt Mawson and Kieran Parker.

Michael Philcox presented with his award

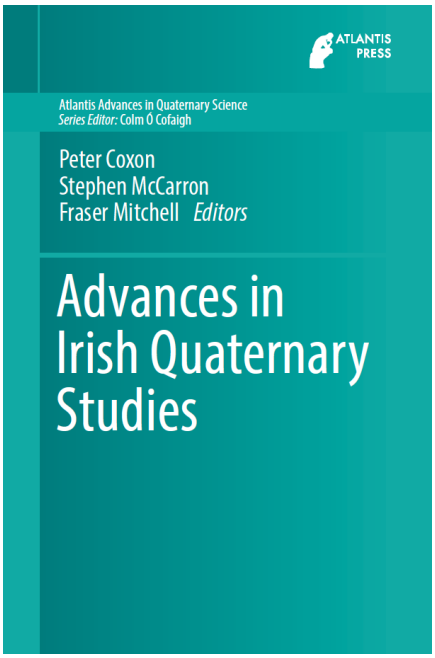
MARA – Successful Ship Time Application from the Marine Institute

Dr Kieran Craven was recently awarded grant aid for 10 days' ship-time (16th March to 25th March) on board the Celtic Voyager for the multidisciplinary survey MAlin shelf sediment ReseArch (MARA). The award was made under the Marine Institute targeted area for early stage researchers.

The aim of MARA is to understand and quantify Quaternary sediment to promote sustainable development of marine resources and better understand ice dynamics of a climatically-driven retreating ice-sheet. The main objectives of MARA are to collect seismic data (sparker) of the Malin shelf to better characterise Quaternary sediment and to conduct comprehensive sediment sampling (grab and core) to groundtruth sediment distribution using a statistically robust methodology.
Data collected will help develop an improved characterisation of the seabed substrate using several interpretation methodologies (classical mapping to more automated/mathematical approaches). Resulting map products will be used to develop a more detailed understanding of the processes that formed and actively govern the seabed environment, as well as the benthos that inhabit these environments. This will consequently lead to a better understanding of sediment transport processes in the region (relevant to any activity (commercial or otherwise) that interacts with seabed environment; and provide better predictability of the distribution of benthic flora/fauna in this poorly understood region.

MARA will address several key national priorities. By providing essential groundtruthing of sediment, increased resolution seismic characterisation, and onboard training, this study will directly address four of the eight enablers (clean, green, marine; research; knowledge, technology and innovation; capacity, education, training and awareness; and infrastructure) of the integrated Marine Plan for Ireland (Harnessing Our Ocean Wealth) and will thereby facilatate achieving of the plan's main goals: a thriving maritime economy, achieving healthy ecosystems and increasing our engagment with the sea.

Publication of a new book on the Irish Quaternary: Coxon, P., McCarron,S. and Mitchell, F. (eds) 2017. *Advances in Irish Quaternary Studies.* Atlantis Press. Paris. 316pp. DOI 10.2991/978-94-6239-219-9



This edited volume draws together a range of Quaternary topics where significant advances have been made since the 1980s. The book's contents include an introduction and a further nine chapters each with extensive bibliographies:

- **Introduction: Advances in Irish Quaternary Studies** (Peter Coxon, Stephen McCarron and Fraser Mitchell)
- **The Pre-Quaternary Landscape of Ireland** (Michael J. Simms and Peter Coxon)
- **Interglacial Sequences** (Peter Coxon, Fraser Mitchell, Sebastian von Engelbrechten and Laura Vaughan)
- **Glacial Geomorphology of the Last Irish Ice Sheet (**Robert T. Meehan)
- **The Last Irish Ice Sheet: Extent and Chronology** (Colin K. Ballantyne and Colm Ó Cofaigh)
- **Deglaciation of the Northern Irish Sea Basin** (Jasper Knight)
- **Relative Sea-Level Change Around the Irish Coast** (Robin Edwards and Kieran Craven)
- **Periglacial and Paraglacial Processes, Landforms and Sediments** (Peter Wilson)
- **Irish Quaternary Vertebrates** (Nigel T. Monaghan)

Fig. 3 The raised marine wave cut platform in Courtmacsherry Bay. *Upper* The IQUA/QRA fieldtrip (September 2015) to the type locality. The raised beach overlying the platform can be seen as well as the overlying horizontally bedded gravels and sands. The latter have been OSL dated to 36–71 ka BP (Ó Cofaigh et al. 2012). *Lower* The platform as seen by Wright and Muff (1904)

Congratulations to PhD Student Kevin Scheile who won an Outstanding Student Paper Award for his research talk titled "Offshore-onshore correlations refining the glacial history of western Ireland" at the American Geophysical Union (AGU) Fall Meeting, San Francisco, December 2016.

8. Forthcoming workshops, seminars & conferences

Agricultural History Society of Ireland Summer Conference 2017

Clare Island, Co. Mayo — 6000 years of farming history. Tracing the impact on an island environment

Location: Clare Island, Co. Mayo

Venue: Clare Island Community Centre,

Date: Friday, Saturday & Sunday, 23–25 June 2017 (last weekend, June 2017)

Friday: travel and introductory lecture

Saturday: all-day excursion on the island

Sunday: lecture and excursion

For more and updated details consult the Society's web site at http://www.ahsi.ie/

Registration - on Eventbrite

The registration fee is towards the running costs of the conference.Registration fee - AHSI members €15. Registration fee - standard €20. Registration fee - AHSI members €15

If you wish to join and pay or renew your annual subscription see.

Lunch - €10 per person (to be paid when registering)

We will arrange for a packed lunch on the Saturday, if you request same when registering.

We ask you to prepay (€10; on Eventbrite) for the prepacked lunch.

NOTE: Clare Island can be busy during most of the summer. For example, there is a Féile Ceol Weekend on June 30th, July 1st and 2nd, 2017, which no doubt will bring many visitors

9. Obituaries

In memoriam:

Peter Charles Woodman
2nd Jul 1943 – 24th Jan 2017

Peter Woodman, Professor Emeritus of Archaeology and the former Dean of the Faculty of Arts at the National University of Ireland, Cork, died on 24 January following a sudden stroke. He was a graduate in Archaeology from Queen's University Belfast. Originally attracted to the subject of Egyptology, at Queens he first shifted his interest to the Palaeolithic of North Africa and wrote his undergraduate thesis on lithic collections from this region. But he then altered direction and devoted the rest of his academic career to studying the earliest human settlement of Ireland. Over the course of his career he devoted himself to almost every conceivable aspect, both archaeological and environmental, of the Irish Mesolithic. During his term of assistant keeper of antiquities in the Ulster Museum, he completed his PhD which was published in 1978 as *The Mesolithic of Ireland*. This provided the first full synthesis and analysis of all existing data on the Irish Mesolithic, replacing the much earlier work of Hallam Movius of the Harvard Mission to Ireland, and providing a platform on which all future research has been founded. Of his numerous excavations, the one that he is most closely known for was that of Mount Sandel, which he published in 1983 as *Excavations at Mount Sandel, 1973-77*. This provided a detailed account of Ireland's earliest settlement site. In the same year

he relocated to Cork to assume the post as Professor of Archaeology. Up until this time the evidence for the Irish Mesolithic had been largely limited to the northeast of the island (with the exception of Michael Ryan's excavation of Lough Boora in Co Offaly). Peter set out to survey the evidence for the Mesolithic of Munster and was rewarded with the excavation of the important Later Mesolithic site of Ferriter's Cove in the Dingle Peninsula which was published in 1999 as *Excavations at Ferriter's Cove 1983-1995: Last Foragers, First Farmers in the Dingle Peninsula*.

In addition to his research in the traditional residue of archaeological sites, lithics, Peter also had a deep interest in the environmental background of the Irish Mesolithic. This was at least partly stimulated by the fact that the evidence for the Irish Mesolithic economy was so different from neighbouring countries. Fascinated by the challenges that confronted Ireland's earliest colonists who had to deal with one of the most resource poor regions of Europe, Peter helped found the Irish Quaternary Fauna Project. This represented an attempt to ascertain the date of Ireland's mammalian fauna from the Pleistocene and Early Holocene (published in 1997 in *Quaternary Science Reviews* 16, 129-159), a topic which he returned to in his 2014 article "Ireland's native mammals" in D. P. Sleeman et al.'s *Mind the Gap II*.

In 2015 Peter published his final monograph, *Ireland's First Settlers: Time and the Mesolithic*. This book not only provided a much needed update of what we know of the Irish Mesolithic but also positioned our understanding in how our knowledge was acquired and where we should be devoting our attention in the future. At the time of his death, Peter was still very much in harness, planning future research projects with colleagues that would bring new techniques to bear on the critical problems that had fascinated him throughout his career. In a very real sense, Peter's death was untimely and represents a real loss to his family, friends and Irish archaeology.

J.P. Mallory
Professor Emeritus
Queen's University Belfast

In memoriam:

Keith Barber
9th November 1944 - 1st Feb 2017

It is with great sadness that we report that Professor Keith Barber, Emeritus Professor of Environmental Change in Geography and Environment at the University of Southampton, passed away on Wednesday 1st February after a short illness. Many Quaternary scientists owe their career to Keith and he was an outstanding Quaternary palaeoenvironmentalist or 'bogologist' as he preferred. Keith retired in 2009 and was awarded Honorary Membership of the QRA in 2010.

His research combined peat stratigraphy and past human impact and he studied Geography and Botany as an undergraduate at Bristol University going on to complete a PhD *(Peat Stratigraphy and climatic change: a palaeoecological test of the theory of cyclic peat bog regeneration*) at Lancaster University under the supervision of palaeoecologist Frank Oldfield and climate historian Gordon Manley. Keith's great career included training 26 PhD students –a lasting legacy.

A full obituary will follow in the next IQUA Newsletter

Keith's research work is extensive and detailed at:
http://www.southampton.ac.uk/geography/about/staff/keb.page#publications

Some of his Irish work is referred to there including:

Blundell, A., Charman, D. J., and Barber, K. 2007. Multiproxy late Holocene peat records from Ireland:

towards a regional palaeoclimate curve. *J. Quaternary Sci*., **23** pp. 59–71. ISSN 0267-8179.
Clarke, S.H. and Barber, K.E. 2004. Palaeoecology of human impact during the historic period: palynology and geochemistry of a peat deposit at Abbeyknockmoy, Co. Galway, Ireland. Lomas- *The Holocene **14, (5) :***721- 731**doi:** 10.1191/0959683604hl750rp
Hughes, P.D.M. and Barber, K.E. 2004. Contrasting pathways to ombrotrophy in three raised bogs from Ireland and Cumbria, England. *The Holocene **14, (1) :***65-77**doi:**10.1191/0959683604hl690rp
Barber, Keith E., Chambers, Frank M. and Maddy, Darrel. 2003. Holocene palaeoclimates from peat stratigraphy: macrofossil proxy-climate records from three oceanic raised peat bogs in England and Ireland. *Quaternary Science Reviews **22, (5-7)*** **:**521-539 ***doi:***10.1016/S0277-3791(02)00185-3

Professor Pete Coxon
Trinity College Dublin

In memoriam:

Valerie Ann Hall
1946-2016

Valerie Hall passed away on 28 July, 2016, after a long and courageous battle with cancer. Valerie was a highly respected and much loved member of the Irish and international Quaternary world. She was known to many in the IQUA community for her work on Irish pollen and tephra records, but it was her generous nature, her wit and breadth of interests that particularly endeared her to so many. Her early career days and work have been described in detail elsewhere (Plunkett et al. 2016, *Quaternary Geochronology*), so here I present some of my personal memories of working with Valerie.

I first heard of Valerie when studying Archaeology at UCD, specifically researching the Elm Decline and the question of the first farmers in Ireland. The debates for and against an anthropogenic cause hinged, it seemed to me, on the occurrence of pre-Elm Decline Cerealia-type but there was no consensus amongst palynologists or archaeologists on their significance. Then I came across Valerie's paper on the role of harvesting techniques on the dispersal of pollen (Hall 1988) and was struck by how it entailed a very practical approach that could directly inform our interpretation of the past. Given my aversion to what seemed to be moot lines of enquiry that were creeping into Irish archaeology at the time, this scientific approach was music to my ears, and was the first nudge towards the career path I later chose. My interests in past environments developed further while working on the Lord Edward Street/Castle Street excavations in Dublin in 1992-3 and subsequently as a "Bog Body" with the Irish Archaeological Wetland Unit, and it was then that I decided to pursue a Masters degree. For me the choice of institution where I could study what interested me was a toss-up between Queen's and Sheffield, but seeing Valerie's name (she was then in the Institute of Irish Studies) alongside those of Jonathan Pilcher, Jim Mallory and Tom McNeill, Derek Simpson and Michael Avery, clinched it for Queen's and to Belfast I moved in 1994.

From my first classes with her, Valerie's love of bogs and of plants was tangible. She had a talent for story-telling that extended into her teaching, and it was a method she used effectively to draw students into her work and to demonstrate the complexities that palaeoecologists face in their research (her "muddy story"). She was in her element when teaching in the field. At that point, she and Jonathan were relishing in the success of the tephra research they had instigated in Ireland, finding tephra layer after tephra layer in Irish bogs. They were publishing profusely, and at times seemed giddy with the results they were getting. Their exhilaration was contagious, and I opted to do a Masters dissertation that included pollen and tephra, supervised by the two of them. I stayed on to do a PhD, supervised by Jonathan but working alongside Valerie who could advise on all sorts of matters, from pollen identification, to plant communities, to handling the stresses of a PhD. She put in incredible hours on the microprobe and the microscope, and hosted numerous visitors in the Palaeoecology Centre, from established researchers to rising stars of the tephra world, adding to the vibrancy of the School. Valerie talked of how palaeoecology wasn't a job, but a passion. She worked in a very male-dominated environment

(there was only one other female member of academic staff at the time) and she had to endure the humour of the "Axis of Evil" that was Mike Baillie, Tom McNeill and Jim Mallory! But for all that, Valerie was highly respected and loved by all her colleagues, and was a veritable role model and mentor to the female postgraduates. In 1999, Valerie was the Internal Examiner for my PhD, and afterwards, I put her on a new pedestal – a fairer and more encouraging examiner one could not ask for! I will always remember her gentle smile, when two and half hours into the Viva, she nodded towards the External Examiner, and said, "I'll think we'll leave it there", and brought to a close a discussion that might otherwise have continued for the rest of the day!

By that stage, Valerie had transferred to what was by then the School of Archaeology and had rapidly risen to the rank of Professor, a mere 10 years after completing her own PhD. She served on the IQUA Committee, including a period as Secretary, from 1998–2000, and on the Board of Directors of the *Irish Naturalists' Journal* from 1995-1999. She had built a reputation abroad too, and served as Secretary (1995–1999) and then Executive Vice President (1999–2003) to INQUA's Commission for Tephrochronology and Volcanology. After a spell in Dublin following my PhD, I returned in 2002 to Queen's and took up a series of post-doctoral positions with Valerie and Nicki Whitehouse. In the meantime, Valerie, Jonathan and Mike Baillie had established a collaboration with ice core workers in Copenhagen, having demonstrated on the first day of a visit to Copenhagen that they could find tephra in the Holocene ice. The ice core tephra work was a central focus of Valerie's research in the early 2000s (and was one of the projects I worked with her on), but she continued to investigate secular and monastic landscape development in Ireland, while also holding down the considerable role of Director of Research and supervising a number of PhD students. On top of that, Valerie had to deal with recurrent health issues and to care for her ailing mother. Yet I don't recall ever seeing her stressed; somehow, she juggled her responsibilities and remained afloat, possibly thanks to her remarkably pragmatic disposition. She maintained a healthy work-life balance, and savoured opportunities to work in and on the traditional cottage she and her husband George had purchased in Ballyhalbert, Co. Down, its location made all the more special to her by its proximity to the famous Roddansport submerged peat deposit. She had an astonishing range of interests and hobbies, many of them focused around traditional occupations (spinning, weaving, dyeing, bee-keeping) reflecting her passion for understanding the past. She took joy in the opportunities that work afforded her, including invitations to spend time as a Visiting Scholar in New Zealand and China, though she equally looked forward to attending the biannual Roscrea Conferences when she could. As an advisor in its establishment, Valerie had been invited to talk at the CEQUA (Centre for Quaternary Studies of the Fuego-Patagonia-Antarctica region) meeting in southern Chile in 2005, but poor health prevented her from going so she sent me in her stead. In return, Valerie participated in the filming of *The Perfect Corpse* (Nova, 2006), a documentary about National Museum of Ireland's bog body research with which she and I were involved. She was particularly touched by the opportunity to hold the hand of an individual who had lived and died more than 2,000 years ago.

As Valerie neared retirement, I was appointed as an early replacement for her position in 2007. Her route to retirement was marred by the sudden and premature death of her husband, George, at the end of that year. They had been together since 1962, and had had much to look forward to together. Valerie spent a sabbatical in 2008–9 working on her second volume, *The Making of Ireland's Landscapes since the Ice Age* (Collins Press, 2011), and was delighted to spend her final year of employment as a Parnell Fellow at Magdalene College, Cambridge, where she continued this work. She retired officially in 2010, but continued on as Professor Emerita, working on some of her pet projects, including a study of the environmental history of Belfast. In 2014, she was diagnosed for the second time with breast cancer. She began a long period of treatment, but experienced several complications, some of them very serious and protracted. Yet whenever she was able, even when her diagnosis was terminal, she would come back to the School to pick up her research where she'd left off.

As far as I can tell, Valerie got on with everyone she met, and she knew a lot of people from all walks of life, as demonstrated by the number and range of visitors she would have in hospital (queues were not unknown!). Any time I travelled abroad to a conference, I invariably met a researcher who would ask me if I knew Valerie and then proceed to recount their first meeting with her, always, always with some humorous component. I could only marvel at the incredibly positive impact she made on those she met, wherever she went. She rarely said a bad word about anyone, not because she wasn't discerning (she was very shrewd!), but because she chose to focus on the better qualities

of those she knew. Valerie's door was always open to anyone needing advice, on any matter, professional or personal.

Although Valerie was not in the School often in the last few years, her passing has left an enormous hole. She was part of the fabric of the Palaeoecology Centre, and of Archaeology-Palaeoecology through its various iterations at Queen's. For me, she was a pillar of knowledge and wisdom I could always turn to, whether in person, by email or by phone. Now I find myself working on a study of a recent landscape, Valerie's territory so to speak, and I find myself engaging even more with her work. How I would enjoy discussing it with her! Though I seem to keep treading in her footsteps, I don't expect I could ever fill her shoes. Valerie was a remarkable woman and is remembered fondly by all who knew her.

Dr Gill Plunkett,
Archaeology & Palaeoecology,
School of Natural and Built Environment,
Queen's University Belfast,

10. Recent Publications:

Amesbury, M.J., **Swindles, G.T.**, Bobrob, A., Charman, D.J., Holden, J., Lamentowicz, M., Mallon, G., Mazei, Y., Mitchell, E.A.D., Payne, R.J., Roland, T.P., Turner, T.E. and Warner, B.G. 2016. Development of a new pan-European testate amoeba transfer function for reconstructing peatland palaeohydrology. *Quaternary Science Reviews* 152, 132-151.

Barr, I.D., Roberson, S., Flood, R. and Dortch, J., 2017. Younger Dryas glaciers and climate in the Mourne Mountains, Northern Ireland. Journal of Quaternary Science, 32(1), pp.104-115.

Barr, I, Roberson, S and Wilson, P (2016) *The Annalong Valley.* In: The Quaternary glaciation of the Mourne Mountains: Field Guide. Quaternary Research Association, pp. 51-62. ISBN 0907780237

Dempster, M., Cooper, M.R., Dunlop, P. and Scheib, A.J. (2016) *Using soil geochemistry to investigate gold and base metal distribution and dispersal in the glaciated north of Ireland.* In: Unearthed: Impacts of the Tellus surveys of the North of Ireland. (Eds: Young, M.E.), Royal Irish Academy -Science Series Publication, Dublin, pp. 89-99. ISBN 9781908996879

Ely, J.C., Graham, C., Barr, I.D., Rea, B.R., Spagnolo, M. and Evans, J., 2016. Using UAV acquired photography and structure from motion techniques for studying glacier landforms: application to the glacial flutes at Isfallsglaciären. Earth Surface Processes and Landforms.

Fankhauser, A., McDermott, F., Fleitmann, D. (2016) Episodic speleothem deposition tracks the terrestrial impact of millennial-scale last glacial climate variability in SW Ireland. Quat. Sci. Rev. 152, 104-117.

Holmes, P., Grab, S. and Knight, J. 2016. South African geomorphology: current status and new challenges. South African Geographical Journal, 98 (3), 405-416.

Knight, J. and Goff, J.R. 2016. Coastal science for post-tsunami reconstruction. The Holocene, 26 (8), 1334-1340.

Knight, J. and Evans, M. 2017. The sediment stratigraphy of a flood event: an example from the Sabie River, South Africa. Catena, 151, 87-97.

Larter, R. D., Hogan, K. A., Hillenbrand, C.-D. and Benetti, S. (2016) *Debris-flow deposits on the West Antarctic continental slope.* In: Atlas of Submarine Glacial Landforms: Modern, Quaternary and Ancient. (Eds: Dowdeswell, J. A., Canals, M., Jakobsson, M., Todd, B.J., Dowdeswell, E. K. and Hogan, K. A.), Geological Society, London, Memoirs, pp. 375-376. ISBN 9781786202680

Lord, Tom C, Thorp, John A and Wilson, Peter (2016) *A wild boar dominated ungulate assemblage from an early Holocene natural pit fall trap: Cave shaft sediments in northwest England associated with the 9.3 ka BP cold event.* The Holocene, 26 . pp. 147-153.

Lynch, C.M. and Barr, I.D., 2016. Rapid glacial retreat on the Kamchatka Peninsula during the early 21st century. The Cryosphere, 10(4), p.1809

Ludlow, F. (2017) "Volcanology: Chronicling a Medieval Eruption", *Nature Geoscience*, 10 (2), 77-78, doi:10.1038/ngeo2881.

Ludlow, F. and Manning, J. G. (2016) "Revolts under the Ptolemies: A Paleoclimatic Perspective", In: Collins, J. J. and Manning, J. G. (eds.), *Revolt and Resistance in the Ancient*

Classical World and the Near East: The Crucible of Empire. Culture and History of the Ancient Near East Series. Leiden: Brill, 154-171.

Matthews, JA, Wilson, P and Mourne, RW (2017) *Landform transitions from pronival ramparts to moraines and rock glaciers: a case study from the Smorbotn cirque, Romsdalalpane, southern Norway.* Geografiska Annaler, 99A

Matthews, J.A., Owen, G., Winkler, S., Vater, A.E., Wilson, P., Mourne, R.W. and Hill, J.L. (2016) *A rock-surface microweathering index from Schmidt hammer R-values and its preliminary application to some common rock types in southern Norway.* Catena, 143 . pp. 35-44.

Meyer, V.D. and Barr, I.D., 2016. Linking glacier extent and summer temperature in NE Russia-Implications for precipitation during the global Last Glacial Maximum. Palaeogeography, Palaeoclimatology, Palaeoecology, 470, pp.72-80.

Mayet, N., Knight, J. and Grab. S.W. 2016. Spatial and temporal patterns of lightning strikes in the eastern Lesotho Highlands, southern Africa. South African Geographical Journal, 98 (2), 321-336.

MacDonald, G.M., K.A. Moser, A.M. Bloom, **A.P. Potito,** D.F. Porinchu, J.R. Holmquist, J. Hughes and K.V. Kremenetski (2016) Prolonged California aridity linked to climate warming and Pacific sea surface temperature. *Scientific Reports* 6: 33325; doi: 10.1038/srep33325.

McGeever, A.H. and Mitchell, F.J.G. (2016) Re-defining the natural range of Scots Pine (*Pinus sylvestris* L.): A newly discovered microrefugium in western Ireland. *Journal of Biogeography*, **43**, 2199-2208.

McGinley, S., Potito, A.P., Molloy, K., Schot, R., and Stuijts, I. (In press). Lough Lugh, Uisneach: from natural lake to archaeological monument? Journal of Irish Archaeology.

O'Cofaigh, C., Dunlop, P. and Benetti, S. (2016) *Submarine drumlins on the continental shelf offshore of northwest Ireland.* In: Atlas of Submarine Glacial landforms: Modern, Quaternary and Ancient. (Eds: Dowdeswell, J. A., Canals, M., Jakobsson, M., Todd, B.J., Dowdeswell, E.K. and Hogan, K.A.), Geological Society, London, Memoirs, Geological Society Publishing House, Bath, pp. 195-196. ISBN 9781786202680

O'Cofaigh, C, Benetti, S, Dunlop, P. and Monteys, X (2016) *Arcuate moraines on the continental shelf northwest of Ireland.* In: Atlas of Submarine Glacial landforms: Modern, Quaternary and Ancient. (Eds: Dowdeswell, J.A., Canals, M., Jakobsson, M., Todd, B.J., Dowdeswell, E.K. and Hogan, K.A.), Geological Society, London, Memoirs, Geological Society Publishing House, Bath, pp. 253-254. ISBN 9781786202680

Peters, J.L., Benetti, S, Dunlop, P., OCofaigh, C., Moreton, S.G., Wheeler, A.J. and Clark, C.D. (2016) *Sedimentology and chronology of the advance and retreat of the last British-Irish Ice Sheet on the continental shelf west of Ireland.* Quaternary Science Reviews, 140 . pp. 101-124

Roberson, S., Dunlop, P. and Merritt, J. (2016) *Glacial Geology.* In: The Quaternary Glaciation of the Mourne Mountains Field Guide. (Eds: Roberson, S., Barr, I. and Cooper, M.R.), Quaternary Research Association, Nottingham, pp. 1-181. ISBN 0 907 780 237

Sacchetti, Fabio, Ó Cofaigh, C. and Benetti, Sara (2016) *Iceberg ploughmarks on Rockall Bank, NE Atlantic.* In: Atlas of Submarine Glacial Landforms: Modern, Quaternary and Ancient. (Eds: Dowdeswell, J. A., Canals, M., Jakobsson, M., Todd, B. J., Dowdeswell, E. K. and Hogan, K. A.), Geological Society, London, Memoirs, pp. 277-278. ISBN 9781786202680

Spagnolo, M., Pellitero, R., Barr, I.D., Ely, J.C., Pellicer, X.M. and Rea, B.R., 2017. ACME, a GIS tool for Automated Cirque Metric Extraction. Geomorphology, 278, pp.280-286.

Taylor KJ, Stolze S, Beilman DW, Potito AP (2016) Response of chironomids to Neolithic land-use change in north-west Ireland. The Holocene DOI: 10.1177/0959683616675935

Taylor KJ, Potito AP, Beilman DW, Ghilardi B, O'Connell M (In press) Impact of early prehistoric farming on chironomid communities in northwest Ireland. Journal of Paleolimnology.

Watson, E.J., Swindles, G.T., Savov, I., Lawson, I.T., Connor, C. and Wilson, J. 2017. Estimating the frequency of volcanic ash clouds over northern Europe. *Earth and Planetary Science Letters* 460, 41-49.
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Watson, E.J., Swindles, G.T., Stevenson, J.A., Savov, I. and Lawson, I.T. 2016. The transport of Icelandic volcanic ash: insights from northern

European cryptotephra records. *Journal of Geophysical Research -Solid Earth* 121, 7177-7192.

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11. General Membership Items

Please let your students/ colleagues know about IQUA and encourage them to join.

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Kieran Craven, Department of Geography, Museum Building, Trinity College, Dublin 2.
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