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Editor: Janice Fuller

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## Introduction

Most of you will be aware that Karen Molloy has completed her term as the Newsletter Editor and I think everyone will agree she did an excellent job, for which the committee are particularly grateful. This edition contains reports of the IQUA Symposium and a field meeting of the Glacial Landsystems Working Group; several important dates for your diary including the Autumn Field Excursion; and details of the recent AGM among other items.

Please note that Susan Hegarty has made great changes to the IQUA web page. Upcoming events and information about membership, activities of IQUA and useful links to other related sites can be found. Susan welcomes any comments and additions. You can contact her at: [hegarty@tec.irlgov.ie](mailto:hegarty@tec.irlgov.ie).

<http://homepage.eircom.net/~iqua/>

The email Bulletin Board is a very useful method for circulating news and announcements among IQUA members. If you have an email account and would like to subscribe please contact Karen Molloy ([Karen.Molloy@NUIGalway.ie](mailto:Karen.Molloy@NUIGalway.ie)) to be included on the list.

Please send contributions for the next Newsletter to me by **October 31<sup>st</sup>**. Details of recent publications, conference reports, new research projects etc. are welcome.

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## IQUA Annual Symposium 1999: 'The Quaternary beyond the Ice Sheets'

If you are like me, when you think of the Quaternary, and especially the Last Glacial Maximum (LGM), you think of ice and great dirty meltwater streams eroding and depositing large quantities of sediment. However, this picture of the Quaternary during LGM is only valid for approximately 30% of the earth's land surface. In his introductory talk to the 1999 IQUA symposium, Michael Philcox said that the topic had grown out of a "personal curiosity" which made him ask, "What did happen beyond the ice sheets during the Quaternary?"

The annual symposium was held at the Geological Survey of Ireland, in Beggar's Bush in Dublin and hosted nine speakers, as well as, one poster presentation. The first talk was given by **Michael Thomas** of the University of Stirling on landscape response to rapid late Quaternary climate transitions in the Tropics. The presentation provided an introduction to what was happening at a range of sites across the mid-tropics during the LGM, when these regions saw an increased aridification, and at the transition into the Holocene which was marked by a rapid uprise in the amount of precipitation, up to 10 - 20% greater than today. This was followed by a talk by **Robert Devoy** of UCC on the impacts of climate change and ocean circulation on the European Shelf margins. The presentation stressed the

importance of a unifying theory between the crust and ocean circulation, and presented some recent work carried out in Cork Harbour.

Following coffee and an exchange of ideas, we launched into next session, which was to concentrate on the palaeoecological story of those regions outside the ice-margins. **Kathy Willis**, of University of Oxford, provided us with a fascinating look at vegetation changes in central and southeastern Europe via a 60m sediment core from Pula Maar. The core contained 40m of finely laminated organic sediments, and when analysed showed switches between boreal and sub-tropical/temperate forest, the timing of which correlated with Milankovitch cycles.

This was followed by an equally interesting topic presented by **Alayne Street-Perrott** of University of Wales, who looked at the importance of changing CO<sub>2</sub> levels in the atmosphere as an influence on vegetation types in the tropics. Interestingly, we learned that not all vegetation change was due to climate change in the tropics, and that depending on the isotopes of carbon used by certain species, some plants were favoured over others.

During lunch we had a chance to look at the poster display by **Wenyang Jiang** from Queen's University Belfast on millennial-scale oscillations of the East-Asian summer monsoon over the last climatic cycle with evidence from weathering signals of loess in northern China. The first talk after lunch was given by **Martin Thorp** of UCD, who presented a paper on response of rivers to climate change in the humid tropics. **Suzanne Leroy** tied in human and climatic factors in explaining the palynological and sedimentological changes in the Dead Sea area over the last 3000 years. Studies on a core of 3.65m in length from this area show that variations in sediments reflect the fluctuations in the extent of the Dead Sea, while the pollen diagram shows the influence of human activity in the area. **Frank McDermott** of UCD presented his work on speleotherms in

the eastern and western Mediterranean as indicators of precipitation in semi-arid regions.

**Peter O'Connor** bravely gave his talk despite losing his slides en route as the airline he travelled with mislaid his bags. He presented his research for his Ph.D. which focussed on dune activity as a record of late Quaternary aridity in the Northern Kalahari. This was followed by a talk by **Fred Aalen** of Trinity College, which presented what is perhaps for many the climax of the Quaternary -the emergence of humans. Although his talk was not from focussed research, but rather from a personal interest, it provided an excellent way to round off proceedings.

All in all, the symposium was a great success, and created a forum for discussion for all those who presented papers, as well as for those of us who attended. In one day we travelled the world from Cork Harbour to China and from Sacred Lake on Mt. Kenya to the Dead Sea. The only continent that was left out was South America!

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**Susan Hegarty, GSI & UCD**

### **Fifth Glacial Landsystems Working Group meeting**

**10th - 12th March, 2000**

The Glacial Landsystems Working Group (GLWG) is a relatively new British based working group which aims to act as a catalyst for research on palaeoglaciological reconstructions, focussing specifically on landform/sediment associations and their application to glaciated landscapes. For their fifth meeting they chose to come to the 'type site' for the Irish Drumlin Readvance moraine, in Kells, County Meath. The meeting was organised by Robbie Meehan (Teagasc, formerly UCD & GSI), who showed us around the area on which he did his Ph.D. thesis, and was attended by more than thirty researchers from Britain and Ireland.



On Saturday morning, from the height of Slieve na Calliagh, Robbie introduced the participants to the geology and the Quaternary history of this area of northwest Meath. The view from such a height (278m) was a reminder that often for the Quaternary geologist height can be your best friend. The "disadvantage" of not having that height on the lowlands was overcome on this field trip with the use of a brilliant Digital Elevation Model for the area, which clearly showed many of the features on which we were standing.

Following this overview of the area, the group moved on to a prominent ridge at Murrens. This feature was interpreted as an esker which formed in the area between two lobes of the Northern Dome of the Irish Ice sheet. However, despite the quality of the exposure in the gravel pit the attention of all present was absorbed by the wonderful demonstration of "how not to dump a truck".

The discussion was resumed in the second pit in the "Murrens esker/delta complex". This pit, cut into the fan-shaped quasi-linear, hummocky ridge topography of the area, displayed sediments that were dominated by fine gravel to coarse boulder clasts. It was suggested that the feature was a supraglacial delta complex, deposited into an ice dammed lake (Glacial Lake Murrens). Following lunch, we made our way to "McGrath's pit", near Milltown, where we saw the distal end of the delta sediments introduced in the earlier stops. At the time of deposition, it is suggested that ice was standing to the south and to the west of the fan. As the ice decayed, the lake grew further.

We then proceeded through the winding roads of northwest Meath until reaching a series of south-southwest aligned ridges at Diamor, south of Slieve na Calliagh. These ridges reached heights of up to 30m, and were variously interpreted as push moraines, mega-flutes, de Geer moraines and a variety of other possible explanations by the participants of the field trip. No conclusion was drawn, however, due to the

lack of exposure to put the landforms into their sedimentological context.

The final stop was "Harton's pit" in the Blackwater valley. This pit, which displayed a lower sequence of crossbedded sands and gravels overlain by a unit of horizontal to subhorizontal cross bedded gravels, was dug into what was interpreted as a kettled sandur formed at the ice margin, with initial deposition occurring into standing water, while the upper unit was deposited after the drainage of the lake. The first day was concluded with a lecture by Robbie to place the sites we had seen that day within the context of the deglacial history of the region where he introduced the contrasting opinions of the Drumlin Readvance. This was followed by intensive discussions about the sites visited that day over a few pints in the local pub, followed by a visit to the local night club by the more 'enthusiastic' members of the group.

The tired and weary were eased into the second day with a stroll to Cakestown just outside Kells, to the first site of the day, the 'Kells Moraine'. This is the type site for the Drumlin Readvance Moraine. The area around Cakestown had been mapped previously as stratified sands and gravels and the ridges were originally interpreted as ice contact gravels with steep ice contact faces that formed during ice sheet readvance. However, Robbie described how these ridges are in fact composed predominantly of an over-consolidated diamict which has been interpreted as basal lodgement till. The till is overlain by a thin veneer of glaciofluvial gravels which are interpreted as proglacial outwash, with meltwater channels dissecting the sediments to flow from north to south to the River Blackwater. The deposits contain no evidence to support an ice marginal origin at the site, thus bringing the whole principal of a single 'Drumlin Readvance' into question.

At a brief stop in Castletown Robbie described the buried drumlins which are a feature of the

area. In the example at Castletown the drumlins were partly buried by stratified gravels. The burying gravels are interpreted as having been deposited at or close to the ice margin during continued and relatively uninterrupted retreat. The consequent 'buried' features at Castletown are difficult to map in the field, and are only really clearly seen on the Digital Elevation Model (DEM) of the area.

Robbie saved us the best site until last with a superb exposure into glaciotectionised sands and gravels at Mullaghmore. Initially interpreted as a cross section through a drumlin, the site is in fact located in an interdrumlin area, and probably reflects a localised readvance of ice resulting in overfolds of and deformation of a glaciofluvial gravel feature during progressive regional ice retreat.

The sites visited over the two days reflected a continuous retreat of ice across Kells and the adjacent areas. An established hypothesis of considerable regional stratigraphic importance, the Drumlin Readvance, does not stand up convincingly when the processes that result in the sediment and landform assemblages investigated on this trip are considered. The trip served to highlight the need for detailed mapping of Quaternary sediments over broad areas and to examine landform - process - landsystem relationships when evaluating the glacial history of an area. The field trip was extremely enjoyable and the area around which Robbie led the group is probably one of the most fascinating and complex areas in Ireland. It includes numerous landform-sediment assemblages which give a detailed insight into the glacial and deglacial conditions in this part of Ireland during the last glacial cycle, and shed important light onto earlier-proposed models of the Irish Quaternary. Robbie left us all with plenty of food for thought as well as plenty of reading material in his very comprehensive and beautifully illustrated handout.

**Susan Hegarty and Aoibheann Kilfeather,  
UCD & GSI**

## **\*Dates for your diary\***

### **1. IQUA Annual Field Meeting October 13-15, 2000**

For more details contact: Valerie Hall, QUB  
(E-mail [V. Hall@Queens-Belfast.ac.uk](mailto:V. Hall@Queens-Belfast.ac.uk))

This year the autumn field meeting will take place in the area of Co. Down known as Strangford and the Ards. This area contains both marine and terrestrial sites of interest to all manner of Quaternary specialists. We will discover the processes which moulded the great Strangford Lough and see evidence of sea level rise in the Holocene. One of the last Late Pleistocene lake deposits in the British Isles, visible only at low tide, will be visited as well as sites of interest to those studying the nature of human impact in the area. As is our practice, local experts will describe new findings at the sites visited. A notice with more details will be circulated among members and information about the trip will be posted on the Bulletin Board and the web page.

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### **2. An international symposium to celebrate the 70<sup>th</sup> birthday of Prof. W.A. Watts**

**'From Palaeoecology to Conservation:  
an Interdisciplinary Vision'**

**October 25 & 26, 2000;  
Royal Irish Academy**

**Organisers:** Fraser Mitchell and Mary Foody,  
Botany Dept., TCD, Dublin 2.

**\*See attached flier for more details\***

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### **3. Irish Field Club Union Conference**

**August 18- 23, 2000;  
Sligo Institute of Technology**

**Enquiries to:** Dr. Julia Nunn, Cherry Cottage,  
11 Ballyhaft Road, Newtownards, Co.  
Down BT22 2AW, Northern Ireland.

**Tel:** 01247 817710.

**E-mail:** [porcupine@strangford.freeseve.co.uk](mailto:porcupine@strangford.freeseve.co.uk)



## **Annual General Meeting 2000**

**Date:** 24<sup>th</sup> March

**Venue:** Trinity College Dublin

The meeting opened at 3.30pm and was attended by 10 members. Michael Philcox chaired the meeting and signed the minutes of the 1999 AGM as being an accurate record.

IQUA continues to function without a secretary and therefore the Secretary's Report was replaced by the Chairman's Report for the second year running. This report outlined the main activities of IQUA over the year including last year's Spring Meeting, the Autumn Field Excursion to the Lower River Bann (organized by Jasper Knight with help from Peter Wilson, Valerie Hall and Mike Simms) and the Annual Symposium to which several overseas speakers were invited. The joint IQUA/IGA lecture organized by the IGA was held on November 11<sup>th</sup>, 1999 in Queen's University Belfast and November 18<sup>th</sup> in Trinity College Dublin. The lecture entitled 'Ice sheets and till sheets: reconstructing environmental change in Ireland during the last glacial cycle' was given by Jasper Knight (UUC). It is the turn of IQUA to organize the joint lecture this year.

The Chairman, Michael Philcox, now represents IQUA on the National Committee for Geology. The relationship between the NCG and INQUA is still being investigated.

Two committee members, Karen Molloy and Andrew Connolly, completed their term of office and the Chairman thanked them for their efforts. The problem of finding a secretary still remains.

The Treasurer's Report indicated that IQUA's funds dropped markedly during the year mainly due to a delay in paying some of the 1998 bills and costs associated with the November Symposium. The closing balance for the year stands at £991.79. The Newsletter Editor reported the usual problem of obtaining material for the newsletter.

The Autumn Fieldtrip is being organized by Valerie Hall and it will be held at Strangford

Lough and the Ards Peninsula, October 13-15th (details above). It has been suggested that the Autumn Symposium could focus on research in the Irish Sea. The topic is still open for discussion.

There was only one nomination for the 2000 committee and this was for the Newsletter Editor. Janice Fuller was accepted unanimously.

Committee members now include:

Chairman	Michael Philcox
Secretary	-
Treasurer	Robbie Meehan
Newsletter Editor	Janice Fuller
Ordinary Members	Susan Hegarty, Aoibheann Kilfeather, Mike Simms and Valerie Hall

The Chairman suggested that the name 'Irish Association for Quaternary Studies' is a little long-winded and should be changed to 'Irish Quaternary Association'. This will have to be announced in advance of the next AGM and voted.

*Minutes kept by Aoibheann Kilfeather*

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## **IQUA Spring Meeting 2000- Abstracts of Papers and Posters**

### **Diachronous Formation of Tunnel-Valleys Beneath the Elsterian Ice Sheet Margin, Southern North Sea Basin**

*Daniel Praeg, Dept. of Geology, UCD*

Hydrodynamic models of glaciation dispute which of two variables, meltwater discharge or substrate transmissivity, controls the patterns of palaeodrainage recorded by tunnel-valleys and eskers. A 3-dimensional analysis of mid-Pleistocene tunnel-valleys in the Southern North Sea Basin, using seismic and well data over a 100x140 km area, yields 3 observations: 1) the tunnel-valleys are blind-ended troughs (up to 0.5 km deep and 6 km wide) that converge southward in an arborescent pattern, recording erosion by drainage to the south; 2)

the troughs are filled by sands that axially downlap northwards beneath subhorizontal lacustrine sediments, recording glaciofluvial backfill to the north; 3) the troughs increase in size and spacing eastward across the area in correspondence with the thickness of the incised Pleistocene deltaic sands. These observations support a model of tunnel-valley formation by coeval headward excavation and backfill beneath the northward receding ice margin, at locations along the margin determined by aquifer transmissivity. Tunnel-valleys are argued to record the diachronous interaction of seasonal ablation with groundwater flow beneath a narrow but highly mobile ice marginal zone.

**Drumlin-like landforms and associated soils at the drumlin re-advance limit, near Kilnaleck, Co. Cavan.**

*J.F. Collins and G. W. Smillie, Faculty of Agriculture, UCD*

The physiography of the 1250ha. Bellsgrove mini-catchment, close to the north shore of L. Sheelin, is dominated by a number of interlocking, echelon drumlins (NW part) and dead-ice deposits (SE part). The drumlins are aligned NW-SE, have fairly typical length/breadth/height ratios and have soils of restricted drainage generally. The dead-ice deposits have adopted two distinct, though merging, landforms: 1. a drumlin-like landform adjoining the drumlin field, and 2. a smooth, gently-sloping, till-coated landform supporting brown earth and grey-brown podzolic soils. The drumlin-like landform consists of a repetitive series of topographic "highs" whose geographic features (shapes, slopes, orientation) are indicative of a genesis common to the adjacent drumlins. They are, however, covered with a varying thicknesses of sorted and semi-sorted gravels and sands which predisposed them to the development of well-drained soils. The topographic 'lows' in this area are similar to, and continuous with, those of the inter-drumlin hollows though no rockland was observed. A shallow cut through part of one of these 'highs' exhibits evidence of a lithologic break at or near the base of the soil solum even though pedogenesis seemed to exploit cryogenic

features in the underlying till to a depth of c. 2m. The data suggest that this landform consists of drumlins partially buried beneath glaciofluvial deposits which thicken in a southerly direction.

**Holocene Environmental Change and History of Land Use at Caherkine Lough, South-East Co. Clare.**

*Heber Mc Mahon, Palaeoenvironmental Unit, NUI, Galway*

Investigations toward the reconstruction of the palaeoenvironment were undertaken on a lake sediment core from Caherkine lough in south-east Clare. Both pollen analytical investigations and whole core Magnetic Susceptibility (MS) were carried out on the sediment resulting in a pollen record with an accompanying MS curve spanning approximately 11,000 years.

Pollen data indicate that oak and elm were the main canopy trees in the densely forested area around Caherkine in the early Holocene. A sharp increase in the MS curve prior to the Elm Decline indicates soil disturbance and mineral inwash into the lake. This is thought to reflect the first disturbance of the landscape by early peoples. Further incursions into the forest by both Bronze Age and later populations altered woodland dynamics and composition.

In this paper pollen data in conjunction with the MS curve are used to reconstruct Holocene vegetation development. In addition the presented results provide an insight into local land-use and environment during major phases of archaeological activity including the construction of Mooghaun Hillfort c. 1.5 km away.

**The role of Giant Irish Deer in the Allerød climatic decline.**

*Fraser Mitchell, Dept. of Botany, TCD*

Irish Late-glacial interstadial from 13,000 to 11,000BP is characterised by low scrub and heathland dominated by *Juniperus* and/or *Empetrum* which developed into open grassland around 12,000BP. This has been



correlated with the Allerød zone. The grass phase terminated abruptly 11,000BP with the onset of a colder climate of the Nahanagan Stadial. The expansion of grassland taxa at the expense of shrub taxa during the Allerød in Ireland has traditionally been interpreted as a response to climatic deterioration in advance of the Nahanagan Stadial. This paper explores the impact of grazing as an alternative cause for this change in vegetation communities.

Moen et al. (1999) have modelled the intake requirements for extant cervids and giant Irish deer in relation to the annual antler cycle. Their model predicts that phosphorus was the critical limiting nutrient for giant Irish deer during antler development. Stratigraphical investigation and radiocarbon dating place the giant Irish deer at its maximum distribution and abundance during the grassland phase of the Late-glacial interstadial. A grassland diet has also been suggested by recent investigations of tooth enamel microwear (Tom Hayden pers comm).

Giant Irish deer would have been selecting the vegetation that would be richest in phosphorus, principally *Salix*. When confined to a grass dominated diet, the Moen model indicates that giant Irish deer would have consumed in excess of their energy requirements to meet their phosphorus requirement. The Moen model modestly predicts that a mature giant Irish deer stag would require 56ha of shrub dominated tundra just to meet its phosphorus requirement during the summer to grow antlers of 40kg mass. The lower shrub and much higher grass component in Ireland during the Late-glacial interstadial grass phase imply that much larger areas would have been required to supply the nutrient requirements to sustain antler development. So the available data suggest a scenario of a grass dominated landscape containing reasonably high populations of giant Irish deer selecting shrubby vegetation which has the highest phosphorus content. It can be concluded that giant Irish deer must have had a profound impact on vegetation community structure and dynamics.

The succession from juniper scrub to grassland

in Ireland during the Late-glacial interstadial is traditionally interpreted as indicating climatic deterioration that steadily continues from 12,000BP until the onset of the Nahanagan Stadial. Climatic reconstructions derived from other sources, namely Coleoptera (beetles) and stable oxygen isotopes do not support this view. The latter sources suggest that there was a stable temperature plateau from 12,000-11,000BP. The modern analogue of red deer (*Cervus elaphus*) foraging on upland heaths in Scotland indicates that red deer densities higher than 1 deer/20ha can prevent tree regeneration. Data on deer densities that would convert *Calluna* dominated heathland to grassland are not available yet but must be somewhat higher than the latter figure. It is therefore entirely plausible that change in vegetation communities from juniper scrub to grassland in Ireland during the Late-glacial interstadial was driven primarily by grazing pressure.

#### Reference

- Moen R.A., Pastor J. & Cohen Y. (1999)  
Antler growth and extinction of Irish elk.  
*Evolutionary Ecology Research* 1, 235-249.

#### **The Vegetational History of the Submerged Peat Deposit at Tralong Bay, Co. Cork**

*Jane Helps, Dept. of Geography, TCD*

Tralong Bay is situated on the south-west coast of Ireland. The bay is sheltered from large-scale erosion from the prevailing winds and tides by its orientation towards the south-east. Peat deposits are exposed on the foreshore at low tide and have a sub-tidal horizontal range of approximately 100-150 m. Several cores have been taken from the site, ranging in depth from 1m to c.5.5m. The deposits appear to be related to sea level changes or coastal configuration as they contain sand lenses throughout the matrix. The cores have been prepared for detailed pollen analysis, loss on ignition analysis and Troels-Smith sediment analysis. This is in order to recreate the vegetational successions recorded in the sediments, providing evidence for environmental changes over the time period. The pollen contained within the peat is

well preserved.

Preliminary palynology and radiocarbon dating indicate this deposit to be Holocene in age, and correlated at the base to c.7000BP; the top of the peat has been radiocarbon dated to c.2000BP. It is hypothesised that the peat built up in a lagoon situation behind a back-barrier, this has now been eroded and the sediment influx halted. The project will use geomorphological data to back up palynological and other evidence to reconstruct the local Holocene environmental history.

**Seasonal-scale variations in the Late-Glacial and Holocene ocean:  $d^{13}C$  and  $d^{18}O$  data from the long-lived bivalve *Arctica islandica* from the Clyde Beds, Scotland, United Kingdom.**

Louise M. A. Purton-Hildebrand, Dept. of Geography, TCD; Melanie J. Leng, NERC Isotope Geoscience Laboratory; Martin D. Brasier, Dept. of Earth Sciences, University of Oxford; Robert M. Kalin, Environmental Engineering Research Centre, Queen's University, Belfast

Just as tree-rings store information about the environment in which they grew, the extant, long-lived, filter-feeding bivalve *Arctica islandica* has been acclaimed the 'tree' of the N. Atlantic storing annual information about the marine environment in which it lived by the size and chemistry of its growth-bands. In this study, over 1,240 stable isotope analyses were made on four large, pristine *Arctica islandica* specimens from the Holocene and Late-Glacial Clyde Bed deposits of western Scotland, UK. These specimens provide a seasonal-scale record of  $d^{13}C$  and  $d^{18}O$  for the mid-shelf environment at this time. AMS radiocarbon dating of these specimens suggest they date from ca. 7,800 calibrated years BP (cal yr BP), ca. 13,100 cal yr BP, ca. 14,400 cal yr BP and ca. 14,650 cal yr BP. When compared with the Greenland Ice-Core Project 2 (GISP2)  $d^{18}O$  curve, these dates suggest these *Arctica* specimens lived during the early Holocene period, the Inter-Allerød Cold Period, the Bølling period and the Oldest Dryas period respectively. Growth-band measurement from acetate peels of the first three of these shells

suggest they had a lifespan of ca. 160, ca. 40, and ca. 10 years respectively. Inferences from  $d^{18}O$  values from these shells suggest that they experienced palaeotemperatures between 9.6 °C and 23.2 °C in the Holocene, between -0.5 °C and 14.3 °C in the Inter-Allerød Cold Period, between 9.8 °C and 20.9 °C for the Bølling, and between 1.6°C and 14.8°C in the Oldest Dryas (assuming normal-marine salinity). These are probably only minimum values because modern *Arctica islandica* grows for only eight out of twelve months.

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**Conservation of Quaternary sites in Ireland**  
Matthew A. Parkes, Geological Survey of Ireland

The Irish Geological Heritage Programme is a partnership between the Geological Survey of Ireland and Dúchas to select and designate important geological and geomorphological sites as Natural Heritage Areas. The entire scheme will be outlined in brief to indicate the work procedure. This outline will be followed by a possible approach to tackle Quaternary sites in three separate themes. These would be a stratigraphical theme and two geomorphological themes dealing with depositional landforms and erosional landforms. It is anticipated that feedback and discussion from the IQUA meeting will be significant in GSI's future strategy regarding selection of key Quaternary sites for geological conservation.

**What's been happening in Wicklow lately?**  
Edwina Cole, Botany Dept., TCD

Previous palaeoecological research in Ireland has provided some insights into past climates and the impacts they have had on the landscape. Most of these data sets have been concerned with the last 10,000-13,000 years; few have the temporal resolution capable of addressing climatic changes which are associated with the last 2,000 years such as the 'Little Ice Age' and 'Medieval Warm Period'. A tephra-dated palaeoecological profile of the



last 1,200 years in Liffey Head Bog, Co. Wicklow based on high resolution multiproxy records is investigated. The results from pollen, fungal spore and tephrochronological analyses presented.

Preliminary interpretations of the data analyzed indicate that if Ireland experienced the Medieval Warm Period its effects were too subtle to be picked up in the pollen and fungal spore records. The fungal spore data suggest that the time slice in which the Little Ice Age occurred in Britain was a dry period in Wicklow and not a wet interval as has been recorded in other areas of Europe. The pollen data neither support nor contradict this theory.

The question remains 'did these events happen in Ireland and if so did Liffey Head not pick them up?' This will be tested by investigating sites in Offaly and Kerry using the same techniques.

#### **Tide gauge data from the Shannon Estuary: An assessment of water level movements and their management**

*Treasa Sheehan, Geography Dept., Mary Immaculate College (not presented)*

The tidal patterns of the Shannon Estuary have, to date, been relatively unexplored. Carter (1991) demonstrates that the Shannon Estuary is particularly sensitive to coastal inundation and sea level rise. The Shannon Estuary offers an unusually long tide gauge record for Ireland, a resource which is not available for any other Irish coastal site. The study is intended to establish whether relative sea level rise has been occurring in the Shannon Estuary and the rate at which it may have changed. The Limerick Docks provide records from the 1877 to the present day. The Hydrological Department of the Office of Public Works also holds records from various sites along the Estuary. As well as analysis of the tidal records, the research project will examine other factors that contribute to variations in these tidal records. These include storms, global warming, climate change and human intervention (dredging, reclamation, and sea defence). Examination of these factors, in addition to

variations in the tidal records of the Shannon Estuary, is expected to produce precise conclusions on the possible impact of changing relative sea level in this region. The results being presented regarding my research are preliminary results of water level movements, as I have just begun my statistical analysis on the tide gauge data of the Shannon Estuary.

#### **Freshwater mollusc palaeoecology and biostratigraphy of the White Bog, Co. Down, Northern Ireland.**

*J. F. Corr, Division of Geography, University of Huddersfield*

Late-Glacial and Holocene palaeoecological investigations in Ireland incorporating freshwater mollusca are sparse, palynological investigations have had the major focus. Presented here are the results from the White Bog, Northern Ireland, which provide an indication of the use of freshwater mollusca and their potential to palaeoecology.

Results from the site indicate an established lake in the early part of the Late-Glacial period with molluscan assemblages changing through time, reflecting fluctuating aquatic vegetation linked to an oscillating local climate. The transition from the Late-Glacial to Holocene at the site is reflected by an increase in molluscan diversity and expansion of aquatic vegetation, both associated with climatic amelioration.

Interpretation of the molluscs provides a complex Late-Glacial and Holocene history of the site as the external influences of climate controlled the aquatic vegetation. The results also show how mollusca have the potential to be an important palaeoecological tool providing localised information which will aid the understanding of results gained from other methods.

These results are part of a wider study investigating Late-Glacial and Holocene freshwater mollusc biostratigraphy and palaeoecology in Ireland. This is currently being carried out as a Doctoral study at the University of Huddersfield.

## **Quaternary Deposits from Crag Cave, County Kerry, Ireland**

*G. Rushworth, The University of Huddersfield*

Caves are sediment traps which can provide important evidence for environmental change. In Ireland, caves offer the potential of providing detail about pre-last glacial Quaternary environments as sediments predating the last glacial maximum have largely been removed in the heavily glaciated landscape. This study is of a sedimentary fill at Crag Cave, Kerry, in an area thought to have been beyond the last glacial limits. The cave fill preserves evidence for at least one local glacial episode, which would seem to predate the last glacial maximum. There is no dating evidence yet for this event.

The samples from this site were recovered from a sediment column in a fill situated in a lower chamber than the present access level and above the present day stream. The top 0.80 m of the column was vertical; the top 0.69 m of which was fine grained and recovered in a monolith column. The rest of the site was coarse grained and sampled in 0.20 m stages as bagged samples.

Of the three phases of sedimentation visible at this site, the lowest two are probably glacio-fluvial or cold stage fluvial in origin. The latest possibly reflects deglaciation and climatic amelioration to a temperate stage. There are significant breaks in the pollen assemblages which may reflect changing source areas during a single glacial episode, or may reflect considerable hiatuses in deposition.

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## **New Members**

IQUA would like to welcome the following new members: Mark Tarplee, Sven Lukas, Treasa Sheehan, Peter Woodman, Louise Geraghty, Daniel Praeg, G. Rushworth.

## **Change of address**

Prof. Suzanne Leroy, Dept. of Geography and Earth Sciences, Brunel University, Uxbridge, London, UB8 3PH, UK.

Email [suzanne.leroy@brunel.ac.uk](mailto:suzanne.leroy@brunel.ac.uk)

## **Student Prize**

Congratulations to Edwina Cole, Dept. of Botany, TCD who won the student prize at the IQUA spring meeting (abstract above).

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## **Recent Publications on Quaternary Research in Ireland**

Knight, J., McCarron, S.G. and McCabe, A.M.  
1999. Landform modification by palaeo-ice streams in east central Ireland. *Annals of Glaciology*, 28, 161-167.

Meehan, R.T. 2000. Kells and adjacent areas, County Meath Ireland. *Glacial Landscapes Working Group Field Guide*, Teagasc, Dublin, 70pp.

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Please send contributions for the Newsletter to:  
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