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Editor: Karen Molloy



Introduction

This lengthy edition of the Newsletter contains many items sure to be of interest to our readers. Members will find details of the forthcoming Annual Symposium entitled **The Quaternary Beyond the Ice Sheets**. This promises to be of interest to many people and the Committee look forward to seeing you there. The list of speakers and topics to be covered are outlined below. An account is also given of the recent, successful Annual Field Meeting to the Lower Bann valley. Two of our members report back from the INQUA Congress held in South Africa and we are brought up to date on a new research project under way at NUI, Galway.

As my four year term of office as IQUA Newsletter Editor draws to a close I would like to take this opportunity to thank all those who have assisted me in my editorial duties, in particular those who have submitted material to the Newsletter. I would urge members to continue to support the Newsletter in the future.

Contributions for the next Newsletter - recent publications, accounts of new research projects, conferences attended etc. - can continue to be

submitted to me. Deadline for submission is March 31st.

IQUA Annual Field Meeting

Lower Bann Valley and Adjacent Areas, 2nd - 3rd October, 1999

The IQUA Annual Field Meeting moved north again this year with the outing to the Lower Bann Region on the first weekend of October. Following a Friday of torrential rain, the trip proved to be an excellent one despite a few niggling showers on both Saturday and Sunday. Twenty five registered overall, down on last years number but still a sizeable gathering for the leader Jasper Knight to co-ordinate. The principal bodies represented were University of Ulster Coleraine, Traad Point Freshwater Research Laboratory, Queens University Belfast, Ulster Museum, Geological Survey of Ireland, Trinity College Dublin, University College Dublin, Teagasc and Department of the Environment, Northern Ireland. The chalets at Ballyscullion Park just outside Bellaghy

provided a picturesque, comfortable and, given the weather, warm (!) centre for our activities and proved a superb choice by Mike Simms on which he should be commended!

Saturday morning we departed Ballyscullion towards Glarryford, the site of a sizeable gravel pit in a 12km long esker system. Having been provided with a route handout, as well as the Field Guide, we had a good insight into the landscape we travelled through despite being part of a six vehicle convoy. The route handout proved an extremely helpful and informative innovation for our trips, on which Jasper should this time be commended! At Glarryford the clouds cleared and, bathed in sunlight, we listened to Jasper explain the sedimentology of the esker itself and the flanking gravel beds. As part of a landscape dominated by drumlins and interdrumlin peat bogs, the esker is somewhat unique in partly overlying and partly having eroded the drumlins. It proves a key site in the area of conservation of geological features in Northern Ireland, as it has been heavily exploited for sand and gravel aggregate in recent years. This we saw at first hand as busy excavators demolished pit faces before our eyes. We then spun northwards to Ballyboyland where a huge basalt quarry exposes several metres of overlying diamict. Jasper gave us a number of explanations for the diamict's genesis and, more importantly, the genesis of the depressions in the bedrock surface. We were made hastily retreat for lunch as another depression, this one being engendered by enormous quantities of rain, began to dominate at the site. The lunch proved yet again commendable and replenished and refreshed we set out for the shores of Lough Neagh. A variety of treats were in store for us that afternoon.

First of all, David Jewson gave us a fantastic

introduction to the diatomite deposits that underlie much of the Bann Valley and the history of their abstraction. These deposits, over 7,500 years old, are an important record of the history of the first peoples in Ireland, containing for example evidence for continuous occupation at Newferry for more than 5,000 years. Rising lake levels and increased winter flooding caused the settlements to become submerged in diatomaceous mud (diatoms being microscopic planktonic plants) which preserved the many artefacts which have since been excavated. We were treated to the passing round of thousands-of-years-old stone tools for our inspection, an amazing experience. We also learned about the extraction of the diatomite during the last century, and especially the use of the material as a 'stabilising' absorbent for explosives in the artillery shells of World War II. An extra treat involved the visit to one of the nearby, disused diatomite factories at Newferry, where Mike Baillie gave us a clear explanation of the (biblical?!) significance of bog oaks. Earlier, we had been told that the prime attraction of the area to early man was the fishing, especially of salmon and eels. We then made a short stop at the nearby eel fishery, one of the more important economic institutions of the Bann Valley area. We marvelled at the modern eel fishing methods, as well as the significance of the fish in an era much different from that of the first eel fishery of the area.

Perhaps the best had been saved for last, as we discovered when we reached Traad Point for our final stop. Following a welcome cup of tea, Suzanne Leroy gave a talk on some of the palaeoecological studies that have been carried out in Lough Neagh, and also gave an insight into the bathymetry of the lake. Clare Carter then gave a short talk on Chironomids

(non-biting midges), whose larvae, which are benthic, are one of the most important indicators of the historical development of lake types worldwide. We adjourned to the laboratory where we saw microscopically these monsters in action, as well as some of the more interesting cores taken from the lake and as outlined by Suzanne earlier. We were also treated to boat-trips on the lake, in so doing trickily attempting to dodge the showers. This memorable sojourn brought an end to a fantastic day in the field, and we left thanking the helpful staff for their great work and preparation of our lakeside afternoon.

Following a beautiful meal in the dining room of Georgian Ballyscullion House, we retreated to the chalets where we were again treated, to a talk by Brian Williams of the DoE Archaeological Service in Northern Ireland. Brian gave an excellent talk on Maritime Archaeology in Northern Ireland, and underwater photos of shipwrecks stick out as a highlight of the talk. Most then retired to bed, but no IQUA trip would be complete without a few piling into (on this occasion) the Chairman's van and speeding off for a pre-dreams-of-drumlins pint in the local!!

Sunday morning we travelled from Ballyscullion across the area of the Armoy moraine, the limit of a late Scottish ice incursion into Ireland, towards Ballycastle. We congregated at nearby Larrybane Bay before trudging over huge boulders of chalk to a cliff recess where Mike Simms introduced us to chalk photokarst; in this case tufa which envelopes mosses and lichens and seems to be 'growing' towards the light outside the caves. The site consists of a distinct raised beach platform, sea caves and associated features which record evidence of events and processes along the coast from late glacial

through Holocene times. The sea caves were formed during the late Devensian rise in relative sea level and then abandoned, and are not true caves in the karst sense. Tufa cascades and stalactites were pointed out to us, as well as small, round holes in the chalk which have been 'eaten' by endolithic algae. These pockmarks proved that rocks are tasty morsels not only to geologists!

Onwards to Portballintrae, where we made a windy stop at cliff sections in the embayment. The sediments here were some of the most interesting seen on the field-trip, and Jasper explained the sequence of events, highlighting well expressed strata which record changes in water depth and energy levels with changes in the position of the ice margin. The abundance of sedimentary structures led to much discussion and admiration of a most interesting site. Following lunch our final field stop occurred at the Grangemore sand dunes, proximal to the Bann estuary. Here John McGourty and Peter Wilson illustrated, with the help of some spectacular Ground Penetrating Radar images, the stratigraphy and hydrology of the dune system. Following a short walk and even shorter but heavy shower, we examined a buried podzol before returning once more to the cars. We then sped off to UU Coleraine for our final engagement.

Again, possibly the best had been saved till last. We were given a laboratory demonstration of the geophysical techniques that are being used to explore the continental shelf of Northern Ireland by workers at the Coastal Resources Group at UUC. Rory Quinn initially gave us a short presentation on the theoretical background to the side-scan sonar, sub-bottom profiler and seismic recorders, and we were then shown some of the resulting plots and maps. The detail

seemed extraordinary and definitely leaves interpretation a much easier task. Michael Philcox then wrapped up the field meeting by thanking all who had contributed, but particularly Jasper. Here I echo that sentiment by concluding that the trip was a most enjoyable and extremely informative one; this fact is mirrored by the superb field guide which should be a must for Quaternary enthusiasts. In particular, the attention to detail, quality of sites and overall presentation was of the highest order, and has made the writing of this (albeit short) summary all the more pleasurable.

Robbie Meehan, Teagasc

Forthcoming Events

IQUA Annual Symposium 1999

The Quaternary beyond the ice sheets

The purpose of this year's annual symposium of the Irish Association for Quaternary Studies (IQUA) will be to focus our attention on aspects of the World's Quaternary that are unfamiliar to most of us living and working in Ireland. Nine invited speakers from Britain and Ireland will cover a range of topics centred around climatic changes, and their effects, in tropical, sub-tropical & Mediterranean regions. Topics and speakers are listed below.

The all-day symposium will be held in the Geological Survey Building, Beggars Bush, Haddington Road, on *Friday, November 19th*. Registration begins at 9.30 a.m., proceedings at 10 a.m. There will be a small fee (£3-4.00) to cover abstracts and refreshments. No prior registration is necessary. Pub and café lunches

can be obtained locally, or bring your own sandwiches.

For further information contact Michael Philcox, tel/fax 045-865 535, or E-mail: mphilcox@tcd.ie

List of speakers (approximate order of speaking)

1. Prof. Michael F. Thomas (University of Stirling): Landscape response to rapid late Quaternary climate transitions in the tropics
2. Prof. Robert Devoy (University College Cork): The impacts of Late Quaternary climate and ocean circulation changes on the European shelf margins

An overview of the role and controls of Quaternary climate and ocean dynamics on the continental shelves in the North Atlantic; links to Quaternary sea-level and isostatic/earth crustal changes; sedimentary and geomorphological nature of the European shelf zones; sediment movements and sinks; ocean current and circulation changes - links to the shelf/land margins in the North Atlantic for the Late Quaternary.

3. Dr. Kathy Willis (Oxford University): Beyond the ice sheets --- initiation of the Northern Hemisphere Glaciation and the short-, medium-and long-term impacts on vegetation in central and south-eastern Europe
4. Prof. Alayne Street-Perrott (University of Wales, Swansea): Late Quaternary history of the tropical rain forests

5. Dr. Martin Thorp (University College Dublin): River behaviour in the humid tropics

6. Dr. Suzanne Leroy (Queens University, Belfast): Palynological and sedimentological record of lake level and climate changes in the Dead Sea area (Israel) during the last 3,000 years

7. Dr. Frank McDermott (University College Dublin): The late Quaternary speleothem record in semi-arid areas: a review of case studies in the Mediterranean region

The use of speleothems in reconstructing palaeoclimates in arid and semi-arid regions, with particular emphasis on contrasts between eastern and western ends of the Mediterranean.

8. Dr. Peter O'Connor (ex-Sheffield University): Reconstruction of Quaternary changes in the aridity in the northern Kalahari, age-dating ancient dunes by means of optically stimulated luminescence; its relevance to climate changes.

9. Dr. Fred Aalen (Trinity College Dublin): The Quaternary: high-tension setting for the age of humans

The relevance of environmental changes to major biological and cultural development, e.g. erect posture, enlarged minds, language, technological advances, early migrations, landscape impacts, increasing social complexity and cultural diversity.

Joint IGA/IQUA Lecture

This year's joint lecture with the IGA will be given by Dr. Jasper Knight of the Glacial Research Group, School of Environmental Sciences, University of Ulster, Coleraine and will be entitled *Ice sheets and till sheets: reconstructing environmental change in Ireland during the last glacial cycle*. The lecture will be given twice in Belfast on Thursday, 11th November in the Lanyon Building, Room W100, The Queen's University, University Road, Belfast at 7.30pm and again in Dublin on Thursday, 18th November in the Museum Building (Lecture Room 4), Trinity College Dublin at 8pm (refreshments 7.30pm).

Abstract of Recently Completed Ph.D. Thesis

Glanville, W. P. 1999. *Holocene Environmental Change and River Behaviour in the Upper River Liffey Catchment, Co. Wicklow, Ireland*. Unpublished Ph.D. Thesis, National University of Ireland, Dublin. 680 pages.

Seven study sites, located within four reaches in the study catchment, were selected for investigation. At each site the valley floor morphology was mapped and the alluvial units identified. The alluvial stratigraphy was examined from natural exposures, man made exposures and from auguring. Alluvium was sampled for sedimentological analysis. Thirty-three radiocarbon dates and one dendro date, were obtained from the alluvial units. A detailed palaeoecological analysis was undertaken from

pollen preserved in anaerobic horizons in the Holocene alluvial units, and from samples taken from a peat core, which provides a continuous record vegetation and vegetation change during the Holocene in the study catchment.

The results indicate three periods of catchment wide alluviation, separated by two short periods of floodplain incision during the Holocene. Floodplain sedimentation occurred between 7800-7280 cal. BP. and 2122-2000 cal. BP., between c. 2000 cal. BP. and c. 500 cal. BP., and from c. 500 cal. BP. to present. The floodplain incision occurred at c. 2122-2000 cal. BP. and soon after c. 500 cal. BP. The palaeoecological results indicate two major phases of woodland clearance in the catchment, firstly, sometime between 4250-3710 cal. BP. and 2750-2320 cal. BP., during the Bronze Age period, and the second phase occurred sometime between 950-740 cal. BP. and 650-500 cal. BP., during the Early Christian and Mediaeval period. The pollen results also indicate the extensive development of blanket peat occurred from c. 3000 cal. BP. The radiocarbon dates indicate increasing rates of floodplain sedimentation towards the present day. In particular, there were two periods of increased floodplain sedimentation, between c. 4000 and c. 2000 cal. BP., and between c. 1000 and c. 500 cal. BP. The periods of increased floodplain sedimentation coincide with the two major phases of identified woodland clearance in the study catchment.

The river channel in the study catchment has tended towards incision, albeit limited, during the Holocene. Vertical channel incision has been between 0.5 and 1 m at the study sites. The

spatial distribution of alluvial units in the catchment is strongly controlled by catchment physiography, which divides the catchment into a number of distinct basin areas. The Holocene fluvial geomorphology has been strongly influenced by inherited Pleistocene deposits, which have controlled channel planform, geometry and gradient. The Holocene fluvial geomorphology in the catchment may be considered as being paraglacial in its nature.

Peter Glanville can be contacted at glanvillep@hotmail.com

Recently completed coursework MSc theses

Dolores Kelly (1999). The Application of Archaeogeophysical Techniques at the site of Newtown, Bantry, Co. Cork and at the Star-shaped Fort at Newtown.

Kevin Sheehan (1999). An Integrated Marine Geophysical Survey of Bantry Bay and an investigation of the site of La Surveillante, County Cork, Ireland.

Note these theses are not available through the Inter-Library loan system and may only be obtained by arrangement with the Applied Geophysics Unit at NUI, Galway.

New Research Project

Interaction between the natural environment and archaeology using geophysical techniques

This project is being carried out over 3 years by

Louise Gerraghty under the supervision of Colin Brown and Kevin Barton. Initial work will concentrate on calibrating techniques such as resistivity tomography (RT) and ground probing radar (GPR) against environments where there is coring data or good exposure. The first test site to be visited will be Lough Fark near Mayo Abbey, Co Mayo (Fuller and O'Connell, 1998) where a 7m lake core has revealed what is tentatively suggested to be a full Holocene sequence. A cored transect down to the lake edge will form part of the section which will be compared to the geophysical sections acquired using RT and GPR. The second test site will be at Seaweed Point near Galway where a shell midden is exposed within the upper 1.5m of a drumlin some 5m high. It is planned to include intertidal, dune, wetland and riverine sites as the work progresses. The project will

ultimately focus on a site where an investigation will be carried out as part of an overall archaeological assessment.

Reference

Fuller, J.L. and O'Connell, M. 1998. Long-term vegetation dynamics and human activity at Mayo Abbey, central Mayo. In: Barton, K. and Molloy, K. (eds). *South Central Mayo*. Field Guide No 22, Irish Association for Quaternary Studies, Dublin.

**Kevin Barton, Applied Geophysics Unit,
NUI, Galway**

INQUA Congress 1999 - "The Environmental Background to Hominid Evolution in Africa" (and much more!) - A Review

The 15th INQUA Congress, which had as its background theme "The Environmental Background to Hominid Evolution in Africa", was held in the International Conference Centre, Durban, South Africa, between the 3rd and the 11th August, 1999. We attended, along with about 800 Quaternary Scientists from all over the world. The Congress venue, a new building less than two years old, proved a most impressive and homely focus for the Congress, its air conditioned theatres and halls even at first glance surpassing the stuffy, oven-like classrooms of Berlin in 1995.

The Conference opened on Tuesday with Registration and Wednesday saw the Opening Ceremony, General Assembly and the first four Plenary Lectures. These 'Plenaries', given each afternoon by a leading specialist in different areas of Quaternary Studies, were to prove a stimulating yet relaxing cornerstone to the academic proceedings at the Congress, a chance to sit through the late afternoon (usually following a hectic morning moving from symposium to symposium) and listen to an area of science not quite familiar but interesting nonetheless. The first four plenaries summarised recent research on global climates of the Quaternary Epoch and emphasised the contribution made by studies of ice core records. This was the first occasion on which we were treated to a bewildering number of histograms and curves which summarised the findings of

years of diligent effort. And the first, though not the last, time when we would be informed that records from the Southern Hemisphere appear to give a more accurate picture of global climate change than the more extensive Northern Hemisphere records.

The second full day saw the Theme Symposium covering "The Environmental Background to Hominid Evolution in Africa" run all day. This series of lectures gave a fascinating insight into the conditions and possible promptings for Hominid Evolution in various parts of the African subcontinent over the last 3.3 million years, serving to show how each piece of Quaternary Research, howsoever small, has a vital role in a worldwide story which includes the forcing factors at work in early human history. It made one realise that, even in Ireland where much of the Quaternary period is much truncated, we have an important part to play in the global Quaternary scheme.

Friday saw the beginning of the first symposia of interest to Glacial Geomorphologists, with 'Glacier Deforming Bed Processes' being discussed. Of particular interest was Richard Waller's talk which explored the presence of deforming beds under cold based glaciers in the Liverpool Bay area of the Western Canadian Arctic, and Chris Clarks talk on ice streams, again in the Canadian Arctic. This was followed by what, for many, was the highlight of the Congress, a talk by Ron Clarke on a new hominid skeleton from Sterkfontein, South Africa. This hominid (details of which published in July's Journal of Quaternary Science) has been dated at between 3.30 and 3.33 Ma, and is the oldest hominid yet discovered. The fact that the

skeleton is almost completely intact makes the find all the more remarkable; the species belongs to that of *Australopithecus*, an early upright hominid with parted toes (like that of an orang-utan, i.e. it can climb with its toes). Listening to this wonderful talk by Dr. Clarke again made it seem worthwhile to be involved in Quaternary Science.

Saturday morning saw an extremely interesting session on 'Quaternary river systems; responses to climatic change' take place. Amazing slides from Nepal and Tibet helped spur our interest in this session. One of the Plenary lectures on Saturday afternoon was given by Jorge Rabassa from Tierra del Fuego, a recent visitor to Ireland. His lecture on the glaciation of that southern portion of South America was an amazing time-journey through the Quaternary, with photos of drumlin fields aged one million years being one of the more remarkable features of his talk.

Sunday's field trip deserves a long paragraph in itself as it was almost enjoyable outing. The trip focussed on 'Durban Geology'; our first stop was the University of Natal which gave us a broad overview of Durban's magnificent harbour, the largest in Africa. We observed the Tertiary age dunes which surround Durban and discussed the sedimentology of the dunes at this site. We then visited a Last Interglacial Raised Beach, remarkable in that it stretched for some 50m or so inland at about 5m elevation above the present day wave-cut platform, giving the illusion of two giant steps out of the ocean to the ridge beyond. Our lunch stop consisted of another beach, this time a Baywatch-like Holocene one, beside karstified Last Interglacial

raised beach with fossilised oyster beds occupying parts of the beach stratigraphy. As we ate our lunch several dolphins continually sped by just offshore, and in the distance we could see humpback whales in all their glory. Our after-lunch stop saw us visiting the famous Dwyka Tillite; lithified glaciomarine 'till' of 300 million year old age, in a 60m high gully section! The tillite has as its maximum thickness 600m, leading to the conclusion that it could only have been deposited in a situation analogous to the Antarctic of today. We then observed closeby striae of similar age. Looking at the well developed striations and chattermarks we wondered at the same subglacial processes which worked as well way back in Carboniferous times as they do today. Many joined us at the striations late, as they insisted on chipping off many pieces of the nearby tillite for souvenir purposes!!

Monday saw the 'Extent and Chronology of Glaciation' session and several good poster sessions, and a meeting was held for all the British and Irish delegates. On Tuesday an interesting symposium on 'Ice sheets, crustal movements and seismicity' was held, as well as an excellent plenary given by Konrad Hughen on ocean circulation changes during the last deglaciation. The Conference dinner was held on Tuesday evening, and the Congress eventually wound down on Wednesday 11th with a relatively quiet discussion revolving around the theme of hominid evolution. After eight days, four field trips, more than 20 business meetings, ten plenary lectures, over two hundred oral presentations and more than 400 posters, it all had to come to a close at some

stage.

The conference was mainly attended by academics. There were few Irish there, probably more to the extortionate cost than lack of interest. There were actually more Irish working overseas attending than Irish workers currently in Ireland. There was a good presence of young Quaternary geologists, particularly from the U.K. and continental Europe, many of whom made poster presentations. The transition from umpteen oral symposia a day to afternoons dedicated to several poster sessions, through which anyone can talk to the author on a more informal basis and can easily view all topics of interest to them, was a very welcome one. It also gave those presenting ample time to talk about their work, as most had 5 minutes or so to introduce their poster.

Theme symposia organised by the scientific Commissions were held throughout the period of the Congress. These were well attended and provided opportunities for hearing about new work for most in a number of disciplines. Business meetings for each of the Commissions, which are the 'engines' behind much of the research supported by INQUA, were held at the close of each day's business. New Officers were elected with responsibility for conducting the business of the Commission during the Inter-Congress period.

This was, in our opinion, a very worthwhile Congress, for a number of reasons. Firstly, it presented a high proportion of the work completed in the last four years on Quaternary Science worldwide, and therefore increases the knowledge base hugely. There are still many problems to be reduced if not solved, in

particular the difficulties of linking the findings of numerous disciplines where the establishment of a secure timeframe remains an obstacle. Secondly, it is a most enjoyable experience to meet Quaternary Scientists from other parts of the World, some of whom are old acquaintances, others having been met before through student field trips and the like. From this, we would love to attend the sixteenth Congress in Reno, Nevada, in 2003, but considering the price of attending this one, will most definitely have to wait and see what the costs are!

Robbie Meehan (Teagasc) and Valerie Hall (Queens University, Belfast)

New Members

As IQUA's membership continues to grow we would like to take this opportunity to welcome the following new members: Mike Baillie, John Feehan, John McDonagh, Wenying Jing, Ryan Corcoran, Donal Daly, Rowan Fealy, Lynn McDowell, John McGourty, William J. O'Shea, Bob Quinn, Anne Fitzgerald, Susan Hegarty, Bernie Lafferty, Lorna A. Mahon, Melissa Swartz. IQUA also wishes to acknowledge the support of our new corporate member Roadstone Dublin Limited.

IQUA wishes to acknowledge the support of our Corporate and Institutional members GeoArc Ltd, Coillte Teo, John A Wood Ltd, Natural History Museum, London,, Roscommon County Library, Ex Libris, Frankfurt and Roadstone Dublin Limited.

Contributions for the next IQUA Newsletter to be sent to: Dr Karen Molloy, IQUA Newsletter Editor, Palaeoenvironmental Research Unit, Department of Botany, NUI, Galway.

Recent Publications on Quaternary Research in Ireland

- Allen, P. 1999. Palaeoecological investigation of material from an alluvial fan on Mount Brandon, Dingle Peninsula, Co. Kerry, South-West Ireland. *Quaternary Newsletter*, **88**, 30-33.
- Brown, A.G. 1999. Biodiversity and pollen analysis: modern pollen studies and the recent history of a floodplain woodland in S.W. Ireland. *Journal of Biogeography*, **26**, 19-32.
- Knight, J. 1999. Morphology and palaeoenvironmental interpretation of deformed soft-sediment clasts: examples from within Late Pleistocene glacial outwash, Tempo Valley, Northern Ireland. *Sedimentary Geology*, **128**, 293-306.
- Knight, J. (ed) 1999. *Lower Bann and Adjacent Areas*. Field Guide No. 23. Irish Association for Quaternary Studies, Dublin.
- Knight, J. and McCabe, A.M. 1999. Late Devensian ice dynamics in Ireland: internal or external controls? *Geological Society of America, Abstracts with Programs*, **31** (7), A-204.
- Knight, J., McCarron, S.G., McCabe, A.M. and Sutton, B. 1999. Sand and gravel aggregate resource management and conservation in Northern Ireland. *Journal of the Geological Society*, **156**, 63-72.