



## 1. Introduction

Dear All,

Welcome to IQUA newsletter No. 36. The IQUA committee agreed that the timing of the IQUA newsletter should be altered to fill the gap between the spring and autumn meetings, thereby providing more regular contact with members. Effective from now, the newsletter will be circulated in January and July/August.

Looking back at the past year IQUA's 2005 calendar began with our Spring research meeting and AGM, held in TCD. A full programme of talks on excellent current research was warmly received. The abstracts from the 2005 IQUA Autumn Symposium are included in this edition (see page 2). The IQUA committee are delighted to see its continued support both through the willingness of contributors to dedicate much time and energy and the attendance of an appreciative audience.

Looking forward, we hope to see everyone joining us at the 2006 Spring research meeting and AGM to be hosted by Nicki Whitehouse at Queens University Belfast.

The IQUA Committee welcome and encourage all members to become more actively involved using our HEANET IQUA-L e-mail list (<https://listserv.heanet.ie/iqua-l.html>). Please check the your details are correct, and if not on there, please sign up! We would like to ensure all e-mail addresses are up to date to ensure you receive this and other notices e.g. about seminars, fieldtrips etc.

*Catherine Dalton*

### IQUA Committee

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## 2. IQUA Fieldmeeting 2006

Possible sites for the IQUA Fieldmeeting 2006 are still being discussed. Suggestions from the IQUA membership are always welcome.

## 3. IQUA Spring Meeting & AGM 2006

**IQUA AGM/Spring Meeting, Saturday 4th March 2006, Queen's University Belfast, Belfast.**

The IQUA Spring Meeting and AGM will be held at Queen's University Belfast on Saturday, March 4th 2006, in the Peter Frogatt Centre, beginning at 10 a.m. The morning and early afternoon will be devoted to talks on current or recently completed research on topics covered by IQUA's broad spread of interests. Postgraduate students are particularly encouraged to report on work in progress.

If you would like to present a paper or a poster, please send me a title as soon as possible, and an Abstract by 20th February 2006. I would appreciate it if research supervisors please encouraged postgraduate students to take part, or offer a paper themselves. We are also keen to hear from people working outside the universities. The programme, when it takes shape, will be posted on the IQUA website ([www.tcd.ie/Geography/IQUA/Index.htm](http://www.tcd.ie/Geography/IQUA/Index.htm)) and via [www.qub.ac.uk/arcpal/events](http://www.qub.ac.uk/arcpal/events), where there

will also be a list of accommodation options for any participants who wish to stay over-night.

I will be organising an informal evening meal for participants who wish to stay over in Belfast, if there is sufficient interest; please let me know if you would like to come along no later than the 20th February. In order to plan numbers it would be helpful to know numbers of participants.

Please do email me if you hope to make the meeting.

Hope to see you on the 4th March!

*Nicki Whitehouse*

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## **4. IQUA Autumn Symposium 2005**

**Symposium Theme: RECONSTRUCTING CHANGING CLIMATES**

### ***Palaeoenvironments of insular Southeast Asia during the Last Glacial Period: A savanna corridor in Sundaland?***

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A range of evidence from geomorphology, palynology, biogeography and vegetation/climate modelling suggests that a north-south 'savanna corridor' did exist through the continent of Sundaland (modern insular Indonesia and Malaysia) through the Last Glacial Period at times of lowered sea-level, as originally proposed by Heaney (1991). A minimal interpretation of the size of this corridor requires a narrow but continuous zone of open 'savanna' vegetation 50-150 km wide, running along the sand-covered divide between the modern South China and Java Seas. This area formed a land bridge between the Malaysian Peninsula and the major islands of Sumatra, Java and Borneo. The savanna corridor connected similar open vegetation types north and south of the equator, and served as a barrier to the dispersal of rainforest-dependent species

between Sumatra and Borneo. A maximal interpretation of the available evidence is compatible with the existence of a broad savanna corridor, with forest restricted to refugia primarily in Sumatra, Borneo and the continental shelf beneath the modern South China Sea. This savanna corridor may have provided a convenient route for the rapid early dispersal of modern humans through the region and on into Australasia.

Consideration of the Quaternary stratigraphy, sea-level history and detailed bathymetry of the Straits of Singapore, the first potential barrier to dispersal between mainland Southeast Asia and Sundaland, suggests that a marine connection between the Indian Ocean and South China Sea through the Straits did not exist until the Last Interglacial Period (oxygen isotope stage 5e). A tenuous connection also existed during stages 5a and 5c, as well as possibly stage 5b. During these periods, strong currents flowed from west to east (the opposite direction to modern net flow) along a narrow palaeochannel that can be identified in the floor of the modern straits. These currents were responsible for scouring the 204m 'over-deepened' basin (the 'Singapore Deeps') and a similar 102m deep basin south of the southern outfall of the Riau Straits. The region has been undergoing down-warping at a rate of 0.06 to 0.1 mm/yr since the beginning of the Last Interglacial Period, and this suggests that the land bridge from Peninsular Malaysia into insular southeast Asia may only have been severed for brief intervals in Stage 5, and thus did not act as a significant barrier to migration for most of the Quaternary.

#### **References**

Heaney, L.R. (1991) A synopsis of climatic and vegetational change in southeast Asia. *Climatic Change*, 19, 53-61.

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### ***Evaluating climatic and environmental events from periglacial slope deposits: a perspective from the southern Irish Sea Basin***

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Quaternary-age slope deposits, and other sediments and structures indicative of a periglacial environment, are found commonly throughout the southern Irish Sea Basin (in southwest England, southern Ireland, west Wales). Although almost all undated, these sediments likely formed episodically since perhaps OIS 9 (around 340 kyr BP) and are likely to be the most valuable and detailed records of mid- to late-Pleistocene climate in southern Britain. However, two major

methodological issues hamper the evaluation of climatic and environmental events from these slope sediments. (1) Lack of radiometric dating control on the sediments means that correlation with marine OIS is largely arbitrary and based on regional lithostratigraphic relationships (which may or may not be valid), and on the position of sediments with respect to underlying 'interglacial' raised marine platforms. (2) Pleistocene glacial-interglacial cycles have been argued to be imprinted monotonically in these sediments as coarse-fine sequences. This assumption is compounded by the techniques of 'lumping' and 'splitting' which tend to underplay and overplay sediment variability, respectively. These issues are explored within the context of climatic and environmental events in the southern Irish Sea Basin region, using examples drawn mainly from west Cornwall.

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### **Quantifying climate change across northern Europe during the Last Glacial-Interglacial Transition (LGIT; 15-10ka BP): Testing hypotheses of climate change using two separate insect proxies**

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The Last Glacial-Interglacial Transition (LGIT) was a period characterised by several rapid, extreme shifts in climate across the North Atlantic region. Identifying the synchronicity of events, and establishing leads and lags within the climate system has proved to be problematic. Quantified climate proxies are important tools in determining the magnitude of past climate shifts. Significant differences in the overall trend and timing of temperature variations across northern Europe during the LGIT have previously been reported using quantified temperature reconstructions of the mean warmest month (TMAX) derived from Coleopteran assemblages (Coope *et al.* 1998). Significantly, though, there was little representation from Ireland, at the extreme western end of the transect.

Ireland's contribution to this debate has not been fully realised, despite being uniquely placed to record changes in the location of the Polar Front and associated changes in climate on the most western extreme of a transect across northern Europe. The prevailing westerly airflow combined with the strongly controlled maritime climate and an absence of any significant ice cap at the time

of the LGIT allow climatic changes to be identified and quantified free from any effects of ice and continentality in the east. The LGIT is well documented, with numerous high-resolution deposits of suitable age. Initial results have suggested there is strong potential for a late glacial tephra chronology, enabling results to be correlated within Ireland and throughout the North Atlantic region.

The results of a new investigation at Lough Nadourcan will be shown, which highlight the response of Ireland to climate forcings at this time. A chironomid-derived temperature reconstruction will be presented. This is the first high-resolution late glacial chironomid temperature reconstruction from Ireland.

The results presented here are the initial findings of a wider project which is directly comparing two of the most commonly used climate proxies; coleoptera and chironomids. There are substantial differences between the statistical approaches employed by these two insect proxies. However despite this, the results obtained from the two proxies at different sites are frequently directly compared. There has been very little work which has attempted to quantify any differences in magnitude and response time between the two insect proxies. By reconstructing climate using the two proxies at the same sites, this issue can be addressed.

### **References**

Coope, G.R. *et al.* 1998. *Journal of Quaternary Science* 13 (5), 419-433

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### **Examining the evidence for solar forcing of Holocene climate from peatlands in the north of Ireland**

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It has been suggested that shifts to wetter and/or cooler conditions in the Holocene are coeval with periods of reduced solar activity, as inferred from the 14C calibration curve (van Geel *et al.*, 1996, 2000; Speranza *et al.*, 2002; Blaauw *et al.*, 2004). However, many studies are limited by the precision of radiocarbon chronologies, so it is difficult to examine the synchronicity of the forcing event and the associated climatic response.

High-resolution palaeohydrological records have been generated from three raised bogs in Northern Ireland spanning a period from the Hekla

4 tephra isochron (c. 2310) to present day. The reconstructions are based on testate amoebae, humification and plant macrofossil analyses and provide evidence for complex bog surface wetness dynamics over this time. As the bogs are ombrotrophic systems, the climate proxy records reflect changes in effective precipitation. In general, the proxies show good agreement, especially when large-magnitude changes are registered. The most meaningful proxy is the reconstruction of water table depth, based on a testate amoebae transfer function approach.

It is evident from the records that shifts to wetter conditions are associated with periods of reduced solar activity atmospheric as inferred from the 14C calibration curve, especially during the late Holocene anomalies (Wolf, Spörer and Maunder minima) and the Homeric minimum in the 1st millennium BC (c. 850 cal. BC). However, the precision provided by a tephrochronology shows that the wet-shifts are not entirely synchronous with the climatic deteriorations. For instance, the wet-phase in the first millennium BC postdates the 850 cal. BC anomaly in all three sites. This calls into question the solar forcing mechanisms and the associated amplification effects at this time (e.g., van Geel *et al.*, 1999).

### References

- Blaauw, M., van Geel, B. & van der Plicht, J. 2004 Solar forcing of climatic change during the mid-Holocene: indications from raised bogs in The Netherlands. *The Holocene* 14, 35-44.
- Speranza, A., van Geel, B. & van der Plicht, J. 2002 Evidence for solar forcing of climate change at ca. 850 cal BC from a Czech peat sequence. *Global and Planetary Change* 35, 51-65.
- van Geel, B., Buurman, J. & Waterbolk, H.T. 1996 Archaeological and palaeoecological indications of an abrupt climate change in The Netherlands, and evidence for climatological teleconnections around 2650 BP. *Journal of Quaternary Science* 11, 451-460.
- van Geel, B., Raspopov, O. M., Renssen, H., van der Plicht, J., Dergachev, V. A., and Meijer, H. A. J. 1999. The role of solar forcing upon climate change. *Quaternary Science Reviews* 18, 331-338.
- van Geel, B., Heusser, C.J., Renssen, H. & Schuurmans, C.J.E. 2000 Climatic change in Chile at around 2700 BP and global evidence for solar forcing: a hypothesis. *The Holocene* 10, 659-664.

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### **Climate and environmental change in New Zealand at the end of the last ice age: testing hypotheses of inter-hemispheric climate change using fossil Coleoptera**

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Understanding the extent to which abrupt interhemispheric climate shifts are synchronous (or not) is pivotal to our understanding of global climate processes and mechanisms. One area which has received relatively little research attention in this debate concerns the quantification of palaeoclimate estimates for the southern hemisphere during periods of rapid climate change, an area recently identified by the Australian INTIMATE group (Turney, 2004). This paper will present preliminary findings of a project concerned with establishing the magnitude and timing of climate change in the southern hemisphere by generating quantified temperature estimates from fossil beetle stratigraphies from deposits dating from the termination of the last ice age from south island, New Zealand. This project is funded by the Centre for Climate, the Environment and Chronology (CHRONO).

New Zealand's location and extreme topography makes its environment sensitive to subtle changes in synoptic conditions and ideally located to study mid-latitude southern hemisphere palaeoclimates. Fossil Coleoptera have been used extensively in the northern hemisphere to provide quantified temperature estimates for the terminal phases of the last ice age. Until recently, very limited work has been undertaken using this proxy in the southern hemisphere and particularly Australasia. Recent research carried out by Marra, Shulmeister and colleagues (Marra *et al.* 2004) has, however, highlighted the exciting potential of this proxy, including the development of a new methodology (Maximum Likelihood Envelope or MLE) for providing past temperature estimates. The use of fossil beetles in southern hemisphere climate research is extremely innovative and is likely to result in new methodologies which will feedback into northern hemisphere research.

Details of three last glacial-interglacial sites (LGIT) to be investigated in New Zealand will be presented. Preliminary results from recent investigations carried out on one of the sites, Cobb Valley on the South Island of New Zealand, will be given. We discuss the wider significance of this project for Southern Hemisphere climate change.

### References

- Turney, C.S.M. 2004. *Towards an Australian event stratigraphy for the Last Termination*. Summary of OZ-INTIMATE workshop, ANSTO Lucas Heights, 6-7 September 2004.
- Marra, M.J.; Smith, E.G.C.; Schulmeister, J. and Leschen, R. 2004. Late Quaternary climate change in the Awatere Valley, south Island, New Zealand using a sine model with a maximum likelihood envelope on fossil beetle data. *Quaternary Science Reviews* 23, 1637-1650.

***Predictive modelling of ringforts: examining the possible influence of climate on settlement in Early Medieval Ireland***

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Predictive modelling is a spatial analytical tool used by archaeologists for highlighting settlement patterns and predicting potential locations of undiscovered archaeological sites. This technique was applied to explore the influence environmental factors may have had on the distribution of ringforts in the Irish midlands. Ringforts are the earthwork remains of agricultural settlements largely constructed during the Early Medieval period. Climatic warming leading up to the medieval warm period is associated with the surge in numbers of ringforts dating 600 to 900 AD. The predictive model in this research identified that ringforts have a distinctive locational pattern and are found mainly on moderately fertile, well drained soils in upland elevations between 80m and 150m above mean sea level within three study areas in Central Ireland. Further analysis of their morphology identified that ringforts in the upland environments tend to be smaller than those in lower lying areas. This research introduces the potential that these upland ringforts may be of a later date than those in lower elevations and may be linked with warmer climate conditions and availability of land previously unsettled in cooler climatic conditions.

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***Documentary evidence for climate reconstruction with particular reference to weather diaries and other observational data sources.***

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This paper sets out to give an overview of the available documentary and observational data sources for Ireland. This includes the monastic annals which are effectively the earliest writings on Ireland, weather diaries, weather compilations, newspapers and journals, the early instrumental data including and the availability of a vast array of instrumental data from the 1880's. A number of case studies will be highlighted including the work of John Rutty from 1716-1766 in Dublin, the Armagh rainfall record from 1838-2001, the Loughrea, Co. Galway Weather Diary of 1858-1863 and the Cork city flood record. A vast amount of potentially useful documentary and observational data has yet to be even looked at for Ireland not to mention analysed. The use of

these types of data is not without their problems and some of the advantages and disadvantages of the method of historical climatology will be outlined in conclusion.

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***Autogenic versus allogenic: Irish raised bogs and 'climate memory'***

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A recent study on a raised bog in west Co. Offaly has revealed the importance of internal system dynamics on mire hydrology leading to implications for the interpretation of proxy hydrological records from Irish raised bogs particularly in relation to climate reconstruction.

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***Are environmental changes during the terminal Neolithic in the Lower Yangtze, China synchronised with human cultural changes?***

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Attempts to link existing models of Holocene environmental variability in the lower Yangtze, China, to cultural changes have been limited by reliance upon assumed relationships between environmental cause and cultural responses and the quality of palaeoenvironmental data. The aim of this research is to investigate vegetation changes in the terminal Neolithic in the Yangtze delta in China and determine whether these changes are synchronised with cultural changes. In collaboration with researchers from Tongji University, Shanghai, China; The University of Western Australia, Perth, Australia; Brunel University, London, England; and The University of Dublin, Trinity College, Dublin, Ireland; multiple proxies of palaeoenvironmental conditions will be analysed in combination with evidence from ongoing archaeological excavations to explore the complex interactions between humans and the environment to improve current understanding and constrain anticipations of future vulnerability to environmental variability. Specifically this research aims to document the phytolith record for four sites within the Yangtze Delta in China close to known archaeological sites. Phytoliths are microscopic silica bodies which form in the cells of plants and have a characteristic shape due to soil, water and climatic conditions (Piperno, 1998; Pearsall, 2000). Results so far indicate that the Yangtze delta sediments provide an excellent

palaeoenvironmental record rich in pollen, phytoliths and charcoal. The high clay content of the deltaic sediments has created some processing challenges yet preliminary results suggest that the environment during the Holocene was greatly influenced by early man and the associated roots of rice cultivation. Rice phytoliths, including the single-celled cuneiform (fan-shaped) leaf buliforms, double peaked glume husks and the more complex multi-celled sheets of the rice husk provide evidence of the existence of rice cultivation throughout the Holocene in Yangtze delta. The C and N stable isotope record for the Hemudu site suggests that the environment has been relatively stable for some time. Preliminary results indicate that C3 type plants (trees, shrubs and temperate-cold climate grasses) were dominant throughout the delta in the Holocene, indicating a climate which was temperate and cool (Cohen 2003). To what extent early agriculture impacted the environment is still unclear. Further on-going research will build upon the current understanding of the palaeoenvironment of the Yangtze delta and provide new insights into human-environment interactions in a pivotal area of the world.

### References

- Cohen AS (2003) *Paleolimnology: the history and evolution of lake systems*. (Oxford University Press: New York).
- Pearsall DM (2000) *Paleoethnobotany: A handbook of procedures*. (Academic Press: San Diego).
- Piperno DR (1988) *Phytolith analysis: an archaeological and geological perspective*. (Academic Press, Inc: San Diego)

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### **Extracting palaeoclimate signals from peat deposits; a new approach**

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Axel Blytt described Norwegian peat sequences in 1876 in which he assumed that the more oxidized layers were indicative of drying of the bog surface. From this he derived a chronology of alternating wet/dry periods in which the drier periods were considered to be more continental in climate and were referred to as *Boreal* and these alternated with wetter periods which were considered to be more oceanic in climate and were referred to as *Atlantic*. Rutger Sernander developed Blytt's concept to produce a chronological scheme in 1908 that covered the late-glacial and Holocene and included temperature as well as precipitation. The so-called Blytt-Sernander scheme was widely adopted across Europe and was modified to suit local conditions. The advent of radiocarbon dating

in the 1950's permitted testing of the regional synchronicity of events in the scheme and found it wanting. This raised questions about the validity of climate records derived for peat deposits and consequently ombrotrophic peat bogs were largely ignored as a source of proxy climate records for the rest of the 20<sup>th</sup> century.

Investigations of a variety of putative climate proxies in peat deposits over the last decade have renewed interest in the capacity of peat deposits to yield palaeoclimate records. The EU fifth framework funded project ACCROTELM aims to test the validity of some of these proxies and explore palaeoclimate variation across Europe over the last 5,000 years based on proxies from peat deposits.

In this paper, data will be presented from a peat profile from one of the ACCROTELM sites in north Tipperary. The profile chronology has been derived via wiggle match radiocarbon dating. Proxies include peat humification, plant macro fossils, testate amoebae, pollen, selected fungal spores and biomolecule analysis. Results from these proxies will be compared and contrasted as well as being examined against other sources of proxy climate data. Completion of this project is due in late 2006 and so this research is ongoing and the results and their interpretation will be preliminary.

More information on the ACCROTELM project can be found at: <http://www2.glos.ac.uk/accrotelm/>

*This year's IQUA symposium was organised by Freea Itzstein-Davey, TCD Geography's very own Aussie. Freea put a huge effort into the event and our very warmest thanks and appreciation go to her. IQUA Chair*

## 6. Research



Past, current and future **I**nteractions between pressures, chemical **L** status and biological **Q**uality elements for lakes **I**n two contrasting instrumented catchments in **I**reland (**ILLUMINATE**)

The Environmental Protection Agency has recently made funds available for the ILLUMINATE project under the Ecology focal area in response to the EU Water Framework Directive.

The project will commence in April 2006 and will involve multi-disciplinary research between partners based in Trinity College, University of Dublin; University of Limerick(MIC); University of Ulster (Coleraine); University College London; the Marine Insititute (Newport); and the south-western and western River Basin Districts. The three-year long project will demonstrate the benefits of integrating high quality ecological, environmental and **palaeolimnological** datasets within a dynamic modelling framework. ILLUMINATE will quantify interactions between current and past ecological pressures and responses, and simulate future scenarios of direct relevance to River Basin District (RBD) managers and environmental regulators, using a combination of existing and new empirical data and results generated by runs of coupled dynamic ecological pressure- response models. ILLUMINATE will therefore mark the first application of coupled ecological pressure-response models specifically calibrated for water catchments in Ireland.

For more information, please contact:

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hand ritual motives such as votive offerings have been put forward. While these two explanations probably cannot be seen as mutually exclusive archaeologist have argued over which was the dominant stimulans for deposits, which can range in size from two to around 200 pieces. The argument has focussed on some key issues, which have been extensively discussed on the basis of finds from different European regions. These include the composition of the assemblage, the types and numbers of artefacts included, their arrangement and the context of deposition. Hence finds from wet sites were usually seen as ritual finds, since they were not retrievable and hoards found in dry contexts were interpreted as profane finds, which were intended to be retrieved. While these aspects will be examined and the arguments discussed and some of them also challenged in this thesis, other aspects, which will help to clarify the character of these depositions in Ireland will also be examined. The results of this study will be set into an European context, comparing with the results of recent regional studies.

Funded by:Irish Research Council for the Humanities and Social Sciences DAAD (German Academic Exchange Service) 2002-2003

[http://www.ucd.ie/archaeology/research/phd/becker\\_katharina/](http://www.ucd.ie/archaeology/research/phd/becker_katharina/)

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## 6. Postgraduate Research

### **Hoards and deposition of the Bronze and Iron Age in Ireland**

Katharina Becker, University College Dublin, School of Archaeology

**Supervisors:** Prof. Barry Raftery and Dr. Joanna Brück

The aim of this study is a comprehensive examination and analysis of patterns of deposition of the Bronze- and Iron Age in Ireland with the main focus on hoards of metalwork. Hoards are defined as the deposition of more than one artefact in the ground. The phenomenon of this type of deposition is known from the Neolithic onwards, the largest number of prehistoric hoards being deposited in the Bronze Age, with around 200 finds. However, while grave finds are quite straightforward in terms of an interpretation, the possible reasons why such large numbers of artefacts of considerable value were placed in the ground and not retrieved have been debated in research history ever since the definition of this class of find. Two opposing lines of interpretation have dominated the discussion. On the one hand profane reasons such as the safekeeping of objects, has been seen as the reason why they got into the ground, on the other

### **The Early Prehistory of Co. Sligo, NW Ireland (7,500-1400BC) A Settlement and Environmental Perspective**

David Keeling, University College Dublin, School of Archaeology

**Supervisor:** Prof. Gabriel Cooney, Archaeology

The principal objective of this study is to detail and analyse the distribution and pattern of settlement within the regional framework of Co. Sligo and within a broad but specific cultural and chronological timespan from the beginning of the Mesolithic to the end of the Early Bronze Age (7,500— 1,400 BC) with particular emphasis on the interaction between settlement and the environment. The role and importance of the regional context and landscape perspective in archaeological research and the significance of Co. Sligo in geographical and archaeological terms is emphasised as part of the background to the approach adopted in the study.

The methodological approach employed centres on integrating the analysis of individual site locations (e.g. through the use of site catchment / territory analysis) with detailed sub—regional studies of areas of specific interest and the examination of the general distributional and locational patterns of the sites and artefacts at

the broader regional level. The reliability and limitations of the available archaeological data as a source for the study of settlement location and distribution is evaluated.

As a background and context for discussion of the settlement pattern, an outline of relevant features of the modern landscape of Co. Sligo is presented followed by a consideration of environmental conditions in the earlier prehistoric period. The discussion focuses particularly on the vegetation record based on palynological research and the anthropogenic impact on the landscape of the region.

A review of the archaeological record for the Irish Mesolithic, Neolithic and Early Bronze Age periods is presented as a context for specific mention of the occurrence of site and artefact material in Co. Sligo. The subsistence pattern in each of the three main cultural and chronological periods under consideration is outlined.

The analysis of the evidence from the region is presented looking at the location, distribution and environmental context of the archaeological data considered. The pattern of location of Mesolithic material in lowlying areas close to water concords with that of Irish Mesolithic sites in general and appears to be influenced by subsistence needs. A critique is presented of Burenhult's model of an indigenous Later Mesolithic origin for the Carrowmore passage tomb cemetery while claims for a Mesolithic date for the smaller crannogs at Lough Gara are examined.

The nature and location of the small number of Neolithic settlement sites suggests that they were seasonal / specialised rather than permanently occupied sites although they appear to share a general placement in situations which would have been attractive to prehistoric farmers. A close spatial relationship with passage tombs could indicate a connection with the construction and / or use of these burial monuments. The siting of the court and portal tombs in north Sligo is analysed in detail and then discussed as part of groups of these tombs in the greater Donegal Bay area. Similarly, the court tombs in south west Sligo are discussed in conjunction with the other court tombs in the adjacent area of east Mayo as part of a regional group extending along the southern flank of the Ox Mountains. A detailed analysis of the two major passage tomb cemeteries at Carrowmore/ Knocknarea and Carrowkeel/Keshcorran reveal important features of the location and layout of the cemeteries

The artefactual evidence adds an important supplement to the site evidence particularly in terms of understanding the extent of Neolithic activity in areas with little or no surviving monument evidence. As the most commonly occurring artefact type in the region, stone axes are the subject of a wide—ranging evaluation. The petrology of the axes indicates the use of a range of lithologies including non—local types such as the Tievebulliagh! Rathlin Island (Co. Antrim) porcellanite.

While the distribution and location of the site and artefact evidence relating to the Later Neolithic / Beaker period shows continuity in the settlement record with areas of established Neolithic activity, there is clear evidence for a lessening of settlement indicators perhaps suggesting a reduction in the level of population density. For the Early Bronze Age the burials constitute the largest single body of evidence for settlement in this period. They are examined from a number of different perspectives and, together with other site and artefact evidence, suggest both continuity and change represented by an infilling of existing areas of intense activity and a parallel expansion in the area settled. In the artefact record, flat copper and bronze axes are the subject of a detailed locational analysis.

The diachronic patterns in the archaeological database used in the study are analysed by statistically comparing and contrasting specific databases and by mapping the general extent and concentration of evidence from the three main cultural and chronological periods under consideration.

[http://www.ucd.ie/archaeology/research/phd/keeling\\_david/](http://www.ucd.ie/archaeology/research/phd/keeling_david/)

## 7. Notices

### Future status of the term 'Quaternary'

In a recent statement (November 2005) Brad Pillins, the President of INQUA announced that a vote had been taken by the International Commission on Stratigraphy on the future status of the term 'Quaternary'. Brad has now asked for the considered opinions of INQUA affiliated groups. As Chair of IQUA, I would like to take this opportunity to ask the Irish Quaternary community for their response. All documentation leading up to the Sept '05 vote can be viewed at the Task Force website:



(<http://www.quaternary.stratigraphy.org.uk/meetings/task.html>)

I will collate your responses and make a representation of our views to the INQUA Executive Committee.

### *A (very) brief history of the events in 2005*

The attendees at an ICS Workshop in September 2005 voted by a majority to accept one of the joint ICS /INQUA Task Force options presented on the rank of the Quaternary. This option (that evolved from extensive discussion, balloting and compromise by members the Task Force) was to formalise the term Quaternary in the geological timescale as a Sub-erathem/Sub-era of the Cenozoic, the upper part of the 'Neogene' System/Period.

Whilst this compromise position downgrades the Quaternary from its implicit and historical usage as a 'Period', it formally ensures the continuation of the name Quaternary. At the same meeting it was unanimously accepted that the chronostratigraphic unit be defined as covering 2.6 Ma of geologic time (to the base of the Gelasian Stage), as recommended by the Task Force.

### *Thanks to the Task force for work on our behalf*

IQUA as the representative body of Quaternary enthusiasts in Ireland and members of INQUA, wish to acknowledge and express our thanks for the persistent and dedicated work undertaken by the INQUA Executive Committee (on which IQUA has representation in the form of Secretary General Pete Coxon) and the members of the Task Force on the Quaternary. Their efforts in ensuring and running a thorough debate on the security of the Quaternary's status and promoting its retention, has been valuable and appreciated by IQUA.

### *IQUA committee views*

The IQUA committee support the proposed designation of the Quaternary as a Sub-Era. Whilst involving a reduction in formal status, it seems to recognise the diversity in the Quaternary community that is after all the reason behind such groups as IQUA. All the potential ramifications of change in status (albeit unofficial) from Period to Sub-era are as yet unknown, but we hope that they will on the whole be positive. We hold the view that the formal acceptance of the Quaternary as a distinct period of geological time, and delineation of its extent to 2.6 Ma, is the point of primary importance. The compromise on its exact status is part of any democratic process.

If any IQUA member has alternate views or wishes to express their agreement with the committee's position, please e-mail the IQUA Chairman ([stephen.mccarron@nuim.ie](mailto:stephen.mccarron@nuim.ie)) before the end of February 2006 to allow a final IQUA position on the issue to be drafted for discussion at the upcoming AGM on 4th March, in Belfast.

*Best regards,  
Stephen McCarron,  
IQUA Chairman  
18/01/06*

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### Notice of IQUA relevant talk in Dublin

***'The Reconstruction of Past Environments:  
the Evidence for the Baltic Region'  
Professor Hansjörg Küster***

Professor Hansjörg Küster, Institut für Geobotanik, Hannover will give a public discourse on *'The Reconstruction of Past Environments: the Evidence for the Baltic Region'* in the Royal Irish Academy, 19 Dawson Street, Dublin 2 on Thursday 23rd February (time to be advised). This should be of great interest to everyone interested in paleoecology and related topics, landscapes and landscape change, or the Baltic region.

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### Renewal of Membership

Please check the date on your address label (on the Newsletter envelope) and contact the Treasurer if you think it is incorrect. Please let your students/ colleagues know about IQUA and encourage them to join.

Please complete the form at: [http://www.tcd.ie/Geography/IQUA/Member/Mem\\_Hme.htm](http://www.tcd.ie/Geography/IQUA/Member/Mem_Hme.htm) and send it with the relevant annual subscription to the Honorary Treasurer of IQUA.

**Full members €15.00  
Students and unwaged €10.00**

Dr. Michael Philcox,  
The Nettle Patch,  
Red Bog,  
Blessington,  
Co. Wicklow.  
E-mail: [mphilcox@tcd.ie](mailto:mphilcox@tcd.ie)

Cheques should be made payable to IQUA. It is suggested that members pay two or three years

subscription on a single transaction, to cut down on bank charges and maintain an active membership for a longer time period.

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**IQUA discussion List**  
<https://listserv.heanet.ie/iqa-l.html>

IQUA members if you are not receiving IQUA listserv emails, please sign up!

To join the IQUA list go to [listserv@listserv.heanet.ie](mailto:listserv@listserv.heanet.ie) and 'Join or leave the list (or change settings)'. A request for subscription to the IQUA-L list goes initially to the list moderator (Catherine Dalton) first for cross-referencing with the membership list.

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**Two PhD scholarships: Impacts of pollution on aquatic ecology**

School of Natural Sciences, Trinity College,  
University of Dublin  
Department of Geography, University of Limerick (MIC)

<b>Closing date:</b>	Friday 17 <sup>th</sup> February, 2006
<b>Start date:</b>	Preferably before May 1st 2006 (or asap thereafter)
<b>Stipend:</b>	€14,000 per annum (research costs and EU-level fees are also covered by the award)

The Environmental Protection Agency has recently made funds available for a project under the Ecology focal area entitled **Past, current and future interactions between pressures, chemical status and biological quality elements for lakes in two contrasting instrumented catchments in Ireland (ILLUMINATE)**. The project will run for 36 months and will involve multi-disciplinary research between partners based in Trinity College, University of Dublin; University of Limerick; University of Ulster (Coleraine); University College London; the Marine Institute (Newport); and the south-western and western River Basin Districts.

Opportunities exist through the project for two fully-funded PhD students. The two PhD students will utilise standard limnological and palaeolimnological techniques to examine past and current ecological responses to combined environmental pressures. PhD project [A] will focus on: 1) current diatom and cladoceran populations; 2) sediment geochemistry; and 3) sediment-based remains of cladocera and fossil diatoms. PhD project [B] will focus on 1) current macrophyte communities; 2) sediment-based algal pigment, pollen and macrophyte remains, and stable C and N isotopes. Both PhD students will be expected to attend training courses, where relevant, and to disseminate the results of their research widely through

participation at international conferences and submissions to high impact journals. Training in the analysis of algal pigment remains (PhD project [B]) will take place at the University of Regina, Canada.

Applicants for the PhD scholarships should send a copy of their curriculum vitae, including names of at least 2 referees, to: Prof. David Taylor  
School of Natural Sciences (<http://www.naturalscience.tcd.ie>)  
Trinity College, University of Dublin  
Email: [taylor@tcd.ie](mailto:taylor@tcd.ie)

Applicants should also indicate clearly whether they are applying for PhD project [A] or [B]

For more details please contact Prof. David Taylor ([taylor@tcd.ie](mailto:taylor@tcd.ie)) or Dr. Catherine Dalton ([catherine.dalton@mic.ul.ie](mailto:catherine.dalton@mic.ul.ie))

## 8. Recent Publications

### Ireland-related Publications:

Wilson, P. 2004. Evidence for and reconstruction of a Nahanagan Stade glacier at Croloughan Lough, Derryveagh Mountains, Co. Donegal. *Irish Journal of Earth Sciences* 22, 45-54.

Cunningham, A. & Wilson, P. 2004. Relict periglacial boulder sheets and lobes on Slieve Donard, Mountains of Mourne, Northern Ireland. *Irish Geography* 37, 187-201.

Smith, M.J., Dunlop, P. and Clark, C.D. 2006. An overview of sub-glacial bedforms in Ireland, mapped from digital elevation data, in Knight, P. (ed) *Glacier Science and Environmental Change*, Blackwell Publishing, p384-387.

### International Publications:

Wilson, P. 2004. Implications of dissected drift at Stockdale Head, western Lake District, northern England. *Geological Journal* 39, 111-115.

Wilson, P. & Edwards, E.J. 2004. Further examples of ventifacts and unusual patterned ground from the Falkland Islands. *Geografiska Annaler* 86A, 107-115.

Wilson, P. & Bateman, M.D. 2004. The Shirdley Hill Sand. In: Chiverrell, R.C., Plater, A.J. & Thomas, G.S.P. (eds), *The Quaternary of the Isle of Man and North West England: Field Guide*. Quaternary Research Association, London, 194-201.

Wilson, P., McGOURTY, J. & Bateman, M.D. 2004. Mid- to late-Holocene coastal dune event

stratigraphy for the north coast of Northern Ireland. *The Holocene* 14, 406-416.

Wilson, P. 2004. Description and implications of valley moraines in upper Eskdale, Lake District. *Proceedings of the Geologists' Association* 115, 55-61.

Wilson, P., Clark, R. & Smith, A. 2004. Rock-slope failures in the Lake District: a preliminary report. *Proceedings, Cumberland Geological Society* 7, 13-36.

Wilson, P. 2004. Relict rock glaciers, slope failure deposits, or polygenetic features? A re-assessment of some Donegal debris landforms. *Irish Geography* 37, 77-87.

Clark, R. & Wilson, P. 2004. A rock avalanche deposit in Burtness Comb, Lake District, northwest England. *Geological Journal* 39, 419-430.

Wilson, P. 2004. J. Gunnar Andersson: Geologist, Polar Explorer and Archaeologist. *The Falkland Islands Journal* 8(3), 76-90.

Wilson, P. 2005. Paraglacial rock-slope failures in Wasdale, western Lake District, England: morphology, styles and significance. *Proceedings of the Geologists' Association* 116, 349-361.

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## 9. News items

### Britonstown Channel saved!

A combined response from a number of people both in IQUA and in the wider geoscience community has helped save a fine glacial channel in Wicklow from a proposal for "reclamation and filling of existing undulating land of approx. 10.7 acres by using topsoil and subsoil only". The channel is just to the south of Poulaphuca dam and bridge and is probably a former outlet for glacial Lake Blessington. Several opinions of respected IQUA authorities indicated that it is indeed a small but fine example of this landform. It is reported to have been used by various teaching parties. The matter was brought to the attention of both the Irish Geological Heritage Programme in GSI and to the Geosciences Committee in the Royal Irish Academy. A submission from GSI to the Wicklow planning authority, in September, played some role in the decision, although there were also many local objections. The refusal cites three reasons of which the first is the council's

policy to protect sites of natural heritage, including those of geological and geomorphological importance, stating that inadequate assessment of the impact of the development has been carried out. However, the geoscience community should remain wary of an appeal or a future resubmission for the same or a modified proposal.

Matthew Parkes

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<http://www.yearofplanetearth.org/>

"By a draft on the International Year of Planet Earth, 2008, which the Committee approved without a vote on 11 November, the Assembly would declare 2008 the International Year of Planet Earth. It would also designate the United Nations Educational, Scientific and Cultural Organization (UNESCO) to organize activities to be undertaken during the Year, in collaboration with UNEP and other relevant United Nations bodies, the International Union of Geological Sciences and other Earth sciences societies and groups throughout the world. Also by that draft, the Assembly would encourage Member States, the United Nations system and other actors to use the Year to increase awareness of the importance of Earth sciences in achieving sustainable development and promoting local, national, regional and international action."

The International Year will support research projects within the following eight broad themes.

1. Groundwater - towards sustainable use
2. Hazards - minimising risk, maximising awareness
3. Earth & Health - building a safer environment
4. Climate - the 'stone tape'
5. Resources - sustainable power for sustainable development
6. Megacities - going deeper, building safer
7. Deep Earth - from crust to core
8. Ocean - abyss of time
9. Soil - Earth's living skin

Downloadable brochures available on:  
<http://www.yearofplanetearth.org/downloads.htm>

**10. Forthcoming Workshops Seminars & Conferences**

**HOLIVAR2006 - Natural Climate Variability and Global Warming**

Environmental Change Research Centre (ECRC),  
University College London  
12-15th June, 2006, London

The HOLIVAR2006 Open Science Meeting will examine how and why the natural climate system varies on different time-scales over the Holocene, and will assess the relative importance of natural processes and human activity in explaining global warming. The programme includes four themed sessions with keynote lectures and poster sessions, and will conclude with a panel discussion.

To find out more, register (fees are 110GBP and 55GBP for students) and/or submit an abstract please use the links below.

<http://www.holivar2006.org>  
<http://www.holivar2006.org/registration.php>

The deadline for registration is 1st May, 2006.  
The deadline for poster abstracts is 1st April 2006.

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**Quaternary Research Association  
5th International Postgraduate Symposium,  
Edinburgh, Scotland.**

29 August 2006 - 1st September 2006

Registration is now open for all postgraduate research students wishing to attend the QRA 5th International Postgraduate Symposium at the Institute of Geography, University of Edinburgh. Building upon recent successes in Plymouth and Brussels, we hope to continue the Symposium's tradition in attracting a diverse group of postgraduate students from around the world. The meeting is designed to provide a forum for delegates to present and discuss their work in a relaxed and informal environment and to facilitate the development of close links within the Quaternary research community. For more

information about the Symposium and how to register please visit the following web site:

<http://www.geos.ed.ac.uk/conferences/qrapg2006>

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**2006**

**The 36th Annual Arctic Workshop**

**INSTAAR**, University of Colorado  
Boulder, Colorado 16-18 March 2006  
<http://instaar.colorado.edu/meetings/AW2006>

**Climate variability and ecosystem impacts on the North Pacific: A basin-scale synthesis.**

PICES/GLOBEC Symposium 19 - 21 April 2006 Hawaii, USA  
[http://www.pices.int/meetings/international\\_symposia/Honolulu2006/default.aspx](http://www.pices.int/meetings/international_symposia/Honolulu2006/default.aspx)

**2nd International Workshop on Ice Caves (IWIC - II)**

08 - 12 May 2006 Demänovská dolina, Slovak Republic  
<http://users.unimi.it/icecaves/IWIC-II/>

**Holivar2006** Open Science Meeting - Natural climate variability and global warming. Environmental Change Research Centre, University College London, UK 12th-15th June 2006. <http://www.holivar2006.org/>

**10th International Paleolimnology Symposium - Past Ecosystem Processes and Human-Environment Interactions.** Duluth, Minnesota, USA June 25-29, 2006  
<http://www.geo.umn.edu/paleolim10/>

**NMR Spectroscopy in Soil, Geo and Environmental Sciences.** Freising, Germany, 6-9 August 2006  
<http://www.wzw.tum.de/bk/nmr06>

**2007**

**XVII INQUA congress** Cairns, Australia 28th July to the 3rd August 2007.  
<http://www.aqua.org.au/AQUA/INQUA2007.html>

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**IQUA Sponsors**

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