IQUA

Cumann Staidéar Ré Cheathartha na h-Éireann

Irish Association for Quaternary Studies

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Editor: Karen Molloy

Introduction

This, my first Newsletter, is a bumper edition and reflects the numerous the activities of the Association and its members. I would like to take this opportunity to remind members that the Newsletter is only as good as the material it receives, I therefore urge members to submit recent publication lists and accounts of anything deemed to be of interest to the Association.

Within these pages are accounts of the Annual Symposium in November, the AGM/Discussion meeting in March and, of course, information on the next IQUA event, namely the annual field meeting which heads south this year to the Killarney area. Details are provided on how to access the IQUA Bulletin Board as well as information on IQUA's Homepage on the World Wide Web.

IQUA is happy to announce its first two Honorary Members, Sybil Watson and Frank Mitchell, as well as its first Corporate Members, Coillte Teoranta, Dublin and GeoArc Ltd., Galway.

On behalf of IQUA I would like congratulate Michael O'Connell on his election to the membership of the Royal Irish Academy.

Sadly, as most IQUA members will by now be aware that Tom Finch, a founder member of IQUA, and one of its most active, passed away towards the end of 1995. An appreciation is included in this Newsletter.

IQUA Annual Symposium 1995:

The Quaternary and Industrial Development

The annual symposium was held at the GSI, Beggars Bush on November 24th and attracted an audience of about 40 people, many from outside IQUA. Speakers came from a wide variety of Irish operating companies, consulting and state organizations. The main topics discussed included engineering classifications of Quaternary sediments, drilling and geophysical techniques, waste disposal, ground water

resources and pollution, legislation, and the role of the Geological Survey.

After a welcome by the GSI's Director, Dr. Peadar McArdle, Dr Tony Beese (Geotechnical consultant, Cork) outlined the engineering classification of 'soils' and drew attention to confusing differences in the meaning of various terms used also by geologists; e.g. 'soil' includes the range of Quaternary sediments and some weathered bedrock; some sandgrades do not correspond to the Wentworth scale.

D. Joyce (Irish Drilling, Ltd.) discussed the pros and cons of various drilling and sampling techniques in relation to different types of unconsolidated sediment. In some cases time/cost mitigates against refined methods of data collection; the intended use of the data is relevant to the choice of technique.

J. Keohane (Geotechnical and Environmental Services, Ltd.), discussing foundation engineering in Quaternary sediments, emphasized the need for a phased approach to planning. Preliminary design determines the type of site investigation required; subsequent test results may show the need for ground improvement work before construction and later monitoring.

C. Shine (Minerex Environmental Ltd.) described the investigation and development of a gravel aquifer in Glen Seilly, Co. Donegal. The gravel fills a narrow channel beneath alluvial and estuarine silts. A variety of exploration and testing techniques was used over a period of several years, to locate, test (yield and chemistry) and develop the aquifer.

M. Smyth (University College Galway) described the investigation of the Quaternary succession beneath Clara Bog, Co. Offaly, using a combination of geophysical techniques and control drilling. Contouring of bog surface, sediment-unit tops and bedrock suggests a link between limestone topography and bog drainage, but the distinction between lake clays and 'boulder clay' from geophysics is not always clear.

J. Derham (Environmental Protection Agency) discussed the use of Quaternary materials in the preparation of landfill sites. Materials include clay for the basal seal, and gravel for the draining of leachate. Problems include the improper use of construction machinery, which can ruin a well designed pit lining.

M. Keegan (consultants Fehily Timoney Weston, Cork) discussed the selection of landfill sites from the legal and organizational viewpoints with particular reference to ground water protection. New guidelines have been developed by the Environmental Protection Agency and GSI. Classification schemes for aquifers and their vulnerability together identify the protection needs and recommended responses.

S. Bennet (K.T. Cullen & Co.) discussed pollution potentials at petrochemical sites, including types and sources of pollutants, surveying methods (before and after accidents), pollutant mobility in various Quaternary sediments, and the assessment of risks for insurance purposes. The level of investigation depends upon budgets and what legislation demands.

R. Creighton (Geological Survey of Ireland) outlined the work of the Quaternary section of the GSI, which is computer-storing data on, e.g., sediment type and depth to bedrock, and is assembling an archive of site investigation records, including lab tests. Clients for this data range through civil engineering, aggregates, waste disposal, town planning, etc. It is important that more companies and consultants should pass their data to the GSI for the general good; the problem of (sometimes unnecessary) confidentiality must be overcome.

T. Nealon (Department of the Environment) outlined proposed EU legislation on ground water management, the Ground water Action Programme, in the context of increasing industrial demand and potential for pollution. Proposals include improved monitoring of water resources and uses, water savings and re-cycling, and closer control of pollution from sources such as agricultural fertilizer.

The symposium was a great success, judging by the level of interest in the papers and the lively discussions. As one rather surprised English visitor remarked 'there are some well informed people in the audience'. Thanks are due to the IQUA organizers, especially Kevin Barton (University College Galway); to all the speakers; and to the GSI for hosting the meeting.

Michael Philcox, (Red Bog, Blessington, Co. Wicklow).

Joint IQUA/IGA Lecture

The joint IQUA/IGA Lecture entitled *Are the Burren stone-free drifts loessic in origin?* was given by Norman Moles in the Department of Geology, Trinity College Dublin on February 14th and in the Department of Geology, University College Galway on 21st March. The abstract was previously sent to all members and is not included here.

IQUA Annual Discussion Meeting 1996 - Abstracts of Papers & Poster

Fresh Evidence for prehistoric agriculture at Céide Fields, North Mayo

Karen Molloy and Michael O'Connell, Department of Botany, University College Galway

That there was substantial Neolithic presence at Céide Fields, North Mayo, is well documented by archaeological field research and excavation. Over 1000 ha of regular field systems defined by stone walls and completely preserved beneath blanket peat have been recorded in this area. However, until recently detailed reconstruction of Neolithic human impact on the landscape through pollen analysis has been lacking. In this paper the results of detailed pollen analytical investigations from a long peat core taken within the field system are reported. These palaeoenvironmental data provide new information as to the nature and duration of human impact during the Neolithic at Céide Fields.

Tree immigration into Ireland during the Early Holocene

Andrew Connolly, Department of Botany, Trinity College Dublin

At the beginning of the Holocene Ireland's tree flora was dominated by *Betula* spp. and *Salix* spp. These were soon replaced by *Pinus, Ulmus* and *Quercus*. The immigration of the tree component of the British and Irish floras has been studied several times (Mitchell, 1956; Smith and Pilcher, 1973; Huntley and Birks, 1983; Bennett, 1988; Birks, 1989). The palaeoecology of two species has also been studied in some detail. *Pinus* (Bennett, 1984; Bradshaw and Browne, 1987) and *Alnus* (Bennett, 1990). A problem with the maps and patterns produced for Ireland in these studies, has been the poor availability of radiocarbon dated sites for the early Holocene in Ireland, particularly in the south. The production of several radiocarbon dated diagrams in the last few years has meant it is now possible to examine the phenomenon of tree migration in Ireland in greater detail. This paper will examine tree migration using the more complete data set.

References:

Bennett, K.D. (1984). The post-glacial history of *Pinus sylvestris* in the British Isles. *Quaternary Science Reviews* 3, 133-135.

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The Quaternary faunas project

Peter C. Woodman, Department of Archaeology, University College Cork

Over the past four years nearly 100 samples of bone have been selected for 14C dating by the Quaternary Faunas Project. The dates were provided by Oxford University AMS laboratory. Many of the sample dates were taken from bones recovered from a series of caves during excavations between 1850 and 1940. These have been supplemented by samples from certain archaeological sites where the date of the introduction of domesticated animals was being examined.

The results of the programme have added considerably to the knowledge of Ireland's

mammalian fauna from the 20,000 year period before the Late Glacial Maximum and has cast new light on the Late Glacial/Early Holocene recolonisation of Ireland.

The Cork-Kerry ice front from Killumney to Courtmacsherry: some conclusions and some problems

Amhlaoibh Ó hAonghusa, 11 Wainsfort Road, Dublin 6

1. *The nature of the front*

The ice sheet appears to have formed a continuous front with no lobes running along valleys. The till has been concentrated in the valleys by movement towards the valleys by the bottom layers of the ice, leaving scanty traces of the front on the uplands. There are some offsets in the line of the front which appear to be due to warmer conditions on south-facing slopes. A hill at Cashelmore 11 km west of the front may have been a nunatak.

Most of the frontal moraine is composed of fine clayey material forming gentle slopes and inconspicuous features but in a few places stony material forms bolder features.

2. The Owenabuee Valley

Before the last glaciation this valley from about Paddy's Bridge, 1 km east of Ballinhassig, drained westwards to join the Bandon via the Brinny. The ice blocked this route, forming a proglacial lake which then silted up completely. A large mass of morainic material, 30 m high, blocks the valley at Garryhankard and Clashinimud.

Recent roadworks near Halfway have revealed that the valley has been filled at this point with greyish varved clays. The alluvial fan at Halfway overlies this fill, and was most likely formed rapidly by the erosion from the uplands of material loosened by periglacial activity.

Southwards of the old Priest's Bridge, excavation revealed a deep channel which had been cut into the fill and also into the valley side leaving a steeper slope at this point. Other steep slopes along the valley were probably formed in the same way. The channel had been filled with organic deposits, silts, and hill slope wash.

The great floods of meltwater which caused these effects are also probably responsible for the vertical rock faces in the Owenabuee gorge at Ballea.

3. Complexities near Courtmacsherry

Near Courtmacsherry deposits clearly belonging to the last glaciation lie in close association with a raised beach and with till, striae, and erratics of eastern provenance which belong to an earlier glaciation. Just east of the village on the south shore of the harbour is the eroding face of a large moraine containing erratics which appear to have all come from the west. This is clearly the terminus of the last ice. Stony patches among the sand flats of the harbour seem to be the cut down remnant of this moraine, but it is not clear that it ever formed a barrier across the valley. Yet flats some 5-6m above H.W. to the west of Timoleague which look like deltas suggest that it may have done so.

4. General

No features of glacial origin, other than outwash, have been noted to the east of this

SUBSCRIBE PALEOLIM firstname lastname

where "firstname lastname" are your first and last names.

2. There is now a TILIA list on the Internet which will be of interest to those of us who struggle to generate pollen and diatom diagrams using this software.

To join the list, users must subscribe themselves. They should address a message to:

listproc@lists.colorado.edu

with the contents of their message being:

subscribe tilia-l <their-full-name>

The subject line of this message should be blank.

3. ARCHAEOBOTANY has been just been launched and aims to facilitate communication through the exchange of information on meetings, conferences, bibliographies, publications,

reference collections and botanical and ethnographic data relevant to the analysis of archaeological plant macro-remains. This group also hopes to exchange ideas about various aspects of archaeobotany such as problems of methodology, identification, presentation and interpretation.

To subscribe send the following command:

SUBSCRIBE ARCHAEOBOTANY firstname lastname

where "firstname lastname" are your first and last names.

to: listproc@eng-h.gov.uk

4. IAG-GEOMORPHLIST is a moderated list for disseminating information of interest to geomorphologists. It is run for the International Association of Geomorphologists by Jeff Lee at Texas Tech University.

Joining IAG-GEOMORPHLIST...Send a message to Jeff at j.lee@ttu.edu and give the following information for the directory. Please provide the information in the format given.

your name

postal address (include country)

phone number (include country code)

fax number (include country code)

e-mail address

a few keywords to identify your interests in geomorphology, topical and/or geographical

(please don't add indentations to the lines)

Please communicate any other useful sites that you discover to the Editor so that they can be publicised in the next Newsletter.

Fraser Mitchell (School of Botany, Trinity College Dublin)

Tom Finch – an appreciation

Thomas Fraser Finch, B.A. (Mod.), M.Sc. (1925 - 1995)

Thomas Fraser Finch born in Donnybrook Dublin graduated from the Department of Geography, Trinity College, Dublin in 1946 with a B.A.(Mod.) After graduation he went to Queen's University Belfast where he studied under the tutelage of Prof. Estyn Evans. Tom then joined the British Colonial Service and was

assigned to the West Indies joining the staff of the Imperial College of Tropical Agriculture in Jamaica working for the Soil Survey of Jamaica. The establishment of An Foras Taluntais (The Agricultural Institute) in 1958 provided the opportunity for Tom to return to his native land and he took up a position in the National Soil Survey in Oct/Nov 1959. In this role he assisted in the first season of survey in Co. Wexford and then in the ensuing years was the principal soil surveyor for Counties Limerick, Clare, Westmeath, and the North Riding of Tipperary. The Tipperary survey was his last major undertaking, when to his dismay and that of his colleagues in the National Soil Survey it was disbanded in the eighties. The areas surveyed by Tom in these counties amounted to approximately 1.2 million hectares or fifteen percent of the country.

Tom was committed to observation and interpretation in the field and persisted with fieldwork right up to his retirement. The fruits of his painstaking fieldwork contained in the Soil Survey Bulletins remain as a worthy model for another generation to follow. In the course of his career he had a deep interest in the Quaternary Period and how glacial events influenced the landscape and the distribution of soils. Over his years of active service in mapping soils and classification he published in his own right and in co-operation with others several papers on the Quaternary in Ireland. Tom was a founder member of both the Irish Quaternary Association and the Soil Science Society of Ireland and was a regular attender at paper and field meetings during his working life and in his all too brief retirement. At these occasions and at work he always displayed a cheerful disposition. His presence will be missed at the Societies outings. All of us who knew Tom express our deepest sympathy to the Finch Family.

Bob Hammond (Teagasc, Dublin)

Annual General Meeting 1996

Date : 9 March 1996 Venue : University College, Cork

About 15 members attended the meeting which was chaired by F. Mitchell (Chairperson). The minutes of the 1995 AGM were circulated, read and accepted as an accurate record of that meeting and signed by the Chairperson.

The Secretary's report was circulated to the members and covered the main items which had arisen over the year.

The Secretary represented IQUA on the RIA National Committee for Geology (NCG) which had an uneventful year. The Secretary's nomination to the NCG for the term expiring on the 31 December 1999 had been ratified by the RIA.

Two fieldtrips were held during the year. A one-day trip to look at fluvial geomorphology in the upper River Liffey catchment was led by Peter Glanville and the annual two-day field trip was organised and led by Peter Wilson and was based in North-west Donegal. The Annual Symposium was on the topic of *The Quaternary and Industrial Development* and was organised by Kevin Barton and was attended by some forty registrants. The Annual IQUA/IGA Lecture was organised by Fraser Mitchell and Norman Moles of Queen's University Belfast presented his

lecture topic of *Are the Burren stone-free drifts loessic in origin?* at both Trinity College Dublin and University College Galway.

On the membership front, Sybil Watson and Frank Mitchell, have accepted the first honorary memberships of IQUA and Coillte and GeoArc Ltd have become the first Corporate members. Membership stood at 87 with 42 having paid their subscriptions. IQUA gained 15 new ordinary and 6 new student members in 1995.

IQUA has now joined the computer-age with a homepage being run on the World Wide Web by Fraser Mitchell and an E-mail Bulletin Board has now been set up by Kevin Barton.

The issue of Public Liability insurance has been resolved by Committee members being covered by joining the Mountaineering Council of Ireland's insurance scheme.

The Treasurer's report was circulated to members. Early receipt of membership subscriptions had resulted in there being an excess of income over expenditure for the year and the Association is in a good position to fund the Field Guide for the 1996 Annual Field Trip.

The Newsletter Editor was not in attendance at the meeting and a short report was given by the Chairperson. An assurance was given that the Newsletter will remain the main channel for communication with the membership and that the Homepage on the World Wide Web and the E-mail Bulletin Board were to be regarded as additional services.

The 1996 Annual Field Meeting is being organised by Cathy Delaney and Peter Coxon and will be to Kerry .The choice of area for the 1997 Field trip was raised and the after some discussion the Midlands was agreed upon. Further one-day excursions were also discussed and an outing to Blessington Gravel pits led by Clare Glanville and Mike Philcox was suggested. A theme revolving around Human impact on, and in, the Quaternary was suggested for the 1996 Autumn Symposium which is to be organised by Fraser Mitchell.

There being no other nominations, the Committee's nominations for the 1996 Executive Committee were accepted and they are :

Chairperson : Fraser Mitchell

Secretary : Kevin Barton

Treasurer : Catherine Delaney

Newsletter Editor : Karen Molloy

Ordinary Members : Michael Philcox, Clare Glanville, Eamon Coady, Peter Glanville.

The Chairperson thanked outgoing members Peter Wilson for his enormous efforts with the Newsletter and John Sweeney for his contributions at various levels to the Association. The meeting concluded with a vote of thanks to Cathy Delaney, Robert Devoy and Anne Sinnott for their organisation of the event.

Kevin Barton (Applied Geophysics Unit, University College Galway)

FIELD MEETING 1996: EAST KERRY, 5-6th OCTOBER

This year's field meeting will take place on the 5th and 6th of October in east Co. Kerry. The meeting will be based in Killarney, and will be led by Pete Coxon, T.C.D. and Cathy Delaney,

U.C.C. Sites to be visited include the Bronze Age copper mines at Ross Island, a monastic site on Inishfallen Island, Lough Leane, moraines and outwash fans in the Killarney area, a coastal spit in Tralee Bay and an interglacial site at Fenit.

Since the meeting includes a boat trip to Inishfallen Island, a registration fee of £3 will be charged to cover extra costs. Those interested in attending the meeting should register by **31st JULY 1996,** by forwarding the registration fee to:

Dr. Cathy Delaney, Department of Geography, University College Cork

Abstracts of Recently Completed PhD Theses in Quaternary Research

Congratulations to both Cathy Delaney and Rosaleen Dwyer on the completion and successful examination of their respective PhD theses.

Cathy is currently based at the Department of Geography, University College Cork but will be taking up a full time position at the Department of Environmental and Geographical Studies, Manchester Metropolitan University in the autumn. However, Cathy remains dedicated to IQUA and will continue in her role as Treasurer.

Rosaleen is currently working at the School of Botany in Trinity College Dublin and plans to be conferred in June. Two papers from her thesis have already been submitted to journals for publication and more are yet to come.

Abstracts from both theses are presented below.

Delaney, C. 1995. *Sedimentology of Late Devensian Deglacial Deposits in the Lough Ree Area, Central Ireland.* Unpublished PhD Thesis, Department of Geology, University of Dublin (Trinity College).

This dissertation is a study of the late Devensian deglaciation of the Lough Ree basin, central Ireland. The landforms created during this period have been studied in order to model the processes of lowland terrestrial deglaciation. In particular, attention has been given to the formation of eskers and of lowland hummocky moraine, for, while these features are commonly associated with regional deglaciation, the conditions under which they form are poorly understood.

The field area was studied initially by mapping of the Quaternary geology of the area, paying particular attention to the landforms. This was carried out initially using vertical aerial photographs, and then by detailed field mapping. Once landforms were identified, four eskers (the Ballymahon, Moyvore, Rooskagh and Athlone eskers) were selected for further study. In addition, an area of hummocky moraine was selected for more detailed field mapping. Detailed sedimentological logging was carried out at selected exposures using lithofacies coding to describe the deposits.

Results indicate that the eskers in the Lough Ree basin were formed as a number of consecutive segments, each consisting of a sharpcrested ridge underlain by proximal ice conduit/ice-walled channel deposits, leading to a wider ridge

underlain by distal ice marginal, subaqueous sediments. Ice conduit/ice-walled channel deposits include pipe-full flow barforms, tunnel mouth barforms, and other barforms which could be deposited in both conduit and free surface conditions. Sedimentary structures indicative of conduit deposition include anticlinal bedding, and backset bedding. Ice marginal subaqueous deposits include deltaic, subwash fan and fan-delta sequences.

Two phases of esker formation were recognised in the area mapped: an eastward draining esker in the south of the area (the Athlone esker) predates the southward draining Rooskagh, Ballymahon and Moyvore eskers.

The lowland hummocky moraine mapped was formed by a combination of supraglacial massflows, supra- and sub-glacial glaciofluvial deposits, ice marginal subaqueous forms, proglacial sandur deposits and crevasse-fill features. Little evidence of active ice was found.

An event stratigraphy of deglaciation of the Midlands is proposed. This involves deposition of the main Midland esker system within an ice stream draining eastwards. Westward retreat of this ice stream is associated with a change in ice flow direction in the northern part of the area mapped, and with inundation of the Midlands to a height of 300ft O.D. Poolbeg (92m). Local readvance in the immediate area of Lough Ree is associated with the formation of subwash fans and delta moraines at the downstream terminii of eskers. Recession northwestwards is associated with stagnation of an ice-marginal zone 3-5km wide, and formation of the eskers in this zone. Eskers were formed diachronously, as the position of the tunnels migrated northwestwards with the recession of the ice sheet.

Dwyer, R.B. 1995. *Blanket Peat Initiation and Development in N.W. Mayo, Ireland.* Unpublished PhD Thesis, University of Dublin (Trinity College).

Many factors have been implicated in the initiation of blanket peat. The patterns involved in the subsequent development peatland have also been discussed. This thesis examines the factors influencing the initiation and development of this landscape feature at one particular site in west Mayo, Croaghaun East.

A sloping site was chosen to investigate the timing of initiation, the physical and vegetational factors involved in initiation, and the subsequent patterns of peat development. The investigation of these factors and patterns required a multi-disciplinary approach involving the use of a range of techniques such as sediment stratigraphy, radiocarbon dating, peat humification analysis, charcoal analysis, palynology, and the identification of fungal spores and testate amoebae. These techniques facilitated the presentation of a detailed record of hydrological and vegetational change at Croaghaun East, whereby the patterns and the causes of blanket peat initiation at this site could be elucidated.

A phase of peat initiation was recorded at the top of the slope which dated to approximately 5,800 years before present (BP) and was seen to be a factor of waterlogging and topography. A later phase of initiation occurred at approximately 3,500 BP. This was seen to be

simultaneously over the lower slopes of the site and is believed to be a consequence of climatic deterioration. This phase was correlated with a period of hydrological change on the upper slopes where the transition to blanket bog (*sensu stricto*) was recorded. Anthropogenic impact appears to have been minimal at this site.

The detection and geochemical analysis of seven discrete layers of tephra (volcanic ash) in the sediment at Croaghaun East, provides the first stratigraphic tephrochronology for the Republic of Ireland. The source eruptions of two deposits were identified while the origins of two others are proposed. One particular tephra layer coincides with the eruption time of Hekla 4. However, individual shard analysis of this tephra does not correlate with the known geochemical profile for this eruption. The coincidence of this tephra layer with the evidence for hydrological and vegetational change at Croaghaun East, introduces speculation on the potential role of volcanic impact on climatic change in the west of Ireland.

RECENT PUBLICATIONS ON QUATERNARY RESEARCH IN IRELAND

Baillie, M.G.L. 1995. Dendrochronology and the chronology of the Irish Bronze Age. In: J. Wadell and E. Shee Twohig (eds.) *Ireland in the Bronze Age*, pp 30-37. Stationary Office, Dublin.

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Baillie, M.G.L. and Brown, D.M. 1995. Some deductions on ancient Irish trees from dendrochronology. In: Pilcher, J.R. and Mac an tSaoir, S. (eds.). *Wood, Trees and Forests in Ireland*. Royal Irish Academy, Dublin, pp. 35-50.

Beese, A.P., Nylan, M.V. 1995. Appendix 1. An investigation of three geological features. In: Hurley, M.F. Excavations in Cork City: Kyrl's Quay/North Main Street and at Grand Parade (Part 1). *Journal of Cork Historic and Archaeological Society*, 100, 86-87.

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Heery, A. 1995. Unidentified algal zygotes in Holocene lake sediment. *Quaternary Newsletter*, 75, 7-8.

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Mitchell, F.J.G., Bradshaw, R.H.W., Hannon, G.E., O'Connell, M., Pilcher, J.R. and Watts, W.A. 1996. Ireland. In: B.E. Berglund, H.J.B. Birks, M. Ralska-Jasiewiczowa and H.E. Wright (eds.) *Palaeoecological events during the last 15,000 years.* John Wiley, Chichester, pp 1-13.

Pilcher, J.R. and Mac an tSaoir, S. (eds) 1995. *Wood, Trees and Forests in Ireland.* Royal Irish Academy, Dublin.

Weir, D.A. 1995. A palynological study of landscape development in County Louth from the second millennium BC to the first millennium AD. In: Anonymous *Discovery Programme Reports: 1. Project Results 1993.* Royal Irish Academy/Discovery Programme, Dublin, pp. 77-126.

Contributions to the next IQUA Newsletter to be sent to: Karen Molloy, IQUA Newsletter Editor, Department of Botany, University College Galway