REPORTS

QRA ANNUAL DISUCSSION MEETING: 'QUATERNARY SCIENCE & SOCIETY'

Beaulieu Hotel, New Forest, 4th-6th January 2012

The QRA Annual Discussion Meeting 2012 was hosted by the University of Southampton, set in the picturesque New Forest with the theme '*Quaternary Science and Society*' and saw the attendance of 120 delegates. This meeting drew upon the multiple interactions between modern Quaternary science and human society with presentations given by Quaternary researchers from universities and research institutions across the globe. The topics discussed were diverse, covering all continents and included material presented from marine, lacustrine, fluvial, terrestrial and glacial environments.

The meeting was organised by Pete Langdon, Tony Brown, John Dearing, Mary Edwards, Paul Hughes and the PLUS postgraduates. Over the course of the three-day meeting, there were nine sessions with oral presentations, a poster session, the QRA awards, the Wiley Lecture, an open debate on the Anthropocene and the conference dinner.

Day 1

Initial sessions and presentations provided valuable climatic context for later sessions which focused on human-climate-ecosystem interactions.

Session 1, titled: 'Quaternary Science, society & the climate system: centennial to millennial scales', covered a diverse range of topics. Proceedings began with **Eelco Rohling** (NOC) who discussed sea surface temperature sensitivity to radiative forcing over the last 520,000 years. **Simon Blockley** (RHUL) and **Christine Lane** (University of Oxford) followed this with talks on the **RESET** project, focussing on the use of tephra records as independent chronological markers to aid the correlation of palaeoenvironmental and archaeological records. The session's diversity continued with **Pete Langdon** (PLUS) presenting a mutliproxy understanding of past methane release in arctic Alaska during the last 12,000 years. **Paul Hughes** (PLUS) concluded the session with an insight into the potential impacts of high tephra loading in Hokkaido, Japan.

The afternoon sessions covered the topic 'Using past interglacials as analogues for the current warm stage' and were aptly introduced by **Eric Wolff** (BAS)

who argued that understanding the precise timings of the start and end of interglacials is crucial for predicting future interglacials. **William Gosling** (Open University) discussed the impacts of interglacial climates on vegetation in the tropics. **Erin McClymont** (Durham University) introduced the role played by ocean circulation in interglacial cycles. The question 'Is the Holocene Typical?' was asked by **Natasha Barlow** (Durham University) with regards to sea-level changes during interglacials. Following this, talks from **Gareth Tye** and **Jennifer Sherriff** (RHUL) explored the climatic structure of MIS11 with regards to human occupation and as an analogue for the Holocene. **Darren Jeffers** (University of Oxford) presented palaeoclimate and vegetation dynamics during the last interglacial in Lebanon. The days proceedings were concluded with an interesting talk from **Jonathan Holmes** (UCL) regarding mid-Holocene climate change in the Sahara and Sahel. He highlighted the importance of non-linearity and transitions in alternate states in order to predict future changes in the region.

Day 2

The second day of the meeting comprised four presentation sessions, the QRA awards and the Wiley lecture given this year by Professor Tom Webb III.

The first session of the day had as its theme 'Quaternary Science and Managing the Natural Environment' and was started off by **John Gordon** (SNH) and **Eleanor Brown** (Natural England) who discussed the importance of Quaternary geodiversity and geoconservation in relation to ecosystem services and climate change adaptation strategies. The importance of palaeoenvironmental and palaeoecological data was further highlighted by **Jim Rose** (RHUL/BGS) in his talk on the importance of Quaternary research and geomorphology in increasing our understanding of the critical earth surface processes that cause landscape change and by **Jane Bunting** who discussed the use of palaeoecological records by the conservation community. The final talk in this session was given by **John Stewart** (University of Bournemouth) on the use of the Quaternary vertebrate fossil record in conservation biology and government policy.

This year, five esteemed members of the Quaternary community were the recipients of the QRA prizes. The QRA's most senior award, the James Croll Medal, was awarded to **Chris Stringer** (Natural History Museum). This medal is awarded to those researchers whose work has made significant contributions to the field of Quaternary science. Chris is currently research leader in human origins at the Natural History Museum in London, and as such leads a research group which is at the forefront of their field. He employs traditional palaeontological methods together with innovative techniques in the field of genetics to gain insight into human origins, the evolution of culture and human evolution, and how this has been influenced by Quaternary climatic

and environmental change. This research, along with his prize-winning books and his work with the media, has allowed Quaternary science to reach a wider audience, not only in the sphere of science but also amongst the general public.

The Lewis Penny Medal, awarded in recognition of the work of young or new scientists who have made a significant contribution to the Quaternary stratigraphy of the British Isles, was awarded to outstanding early career Quaternary researchers, **Ian Candy** (RHUL) and **Sven Lukas** (Queen Mary University of London). Ian's experience in the fields of sedimentology, micromorphology, geochronology and palaeoenvironmental analysis has allowed him to make important advances regarding the lithostratigraphy, chromostratigraphy and biostratigraphy of the British Isles. Sven's work, which examines the use of landforms to understand glacial processes and ice mass dynamics, has led to a greater understanding of the glaciation of the British Isles, and in particular landforms developed during the Younger Dryas.

Honorary Membership of the QRA was bestowed on two individuals this year in recognition their career-long service to Quaternary science – **Doug Harkness**, recognised for his extensive work on radiocarbon analysis and dating, and **Brian Moorlock**, for the extensive mapping work that he carried out during his career with BGS, which allowed new insights into British Quaternary stratigraphy.

The day continued with a session on 'Applied Quaternary Science', which was started off by **Harry Langford** who talked about a late Middle to Late Pleistocene fluvial sedimentary succession at Whittlesey, eastern England. The fluvial theme continued with **Clive Auton**'s (BGS) talk on the application of multidisciplinary Quaternary studies to flood alleviation measures in Scotland. Some practical applications of modelling of Quaternary geology were presented by **Andrew Finlayson** (BGS) in his discussion of the use of 3D modelling of the Quaternary deposits underlying Glasgow to aid planners in the urban regeneration of the city. On a different theme, **Natalie Ludgate** (The Open University) highlighted the use of cave sediments in South East Asia as a source of palaeoenvironmental data and as an indicator of human occupation. This session came to a close with **Mary Edwards** (University of Southampton) whose talk emphasised the use of DNA in detecting plant and animal species in environmental samples and thus in understanding past biodiversity changes.

The afternoon session, 'Human-climate-ecosystem interactions: learning from the past (1)', commenced with **Andy Dugmore** who provided insight into the collapse of the Norse Greenland society and the complex processes that led to its extinction. Following this, **Marie-Jo Gaillard** (Linnaeus University) addressed the subject of land surface-atmosphere feedbacks and their influence on climate through quantitative vegetation reconstruction using fossil pollen data and the REVEALS model. The contribution of the field of archaeology to increasing our understanding of communities' responses to climate change

was highlighted by **Nicki Whitehouse** (Queen's University Belfast), as she presented the results of a project which examined Neolithic farming in Ireland against the wider palaeoclimatic and environmental background. **Tony Brown** (University of Southampton) brought this session to a conclusion with a talk on burnt mounds in the Republic of Ireland and the presentation of the results of palaeoenvironmental analyses of these sites. **Michael Grant**'s (Wessex Archaeology) presentation focused on the New Forest and was very apt given the location of the meeting. It detailed the use of palaeoecological, historic land use and long-term ecological monitoring data to examine the evolution of the Forest's woodlands.

The final session of the day continued on the theme of the previous session, and began with **Rick Battarbee** speaking on the subject of the use of lake sediments to detect greenhouse gas forced climate change. The theme of lake systems as indicators of climate change was also addressed by **Giri Kattel** (University of Ballarat) who highlighted the role of maar lakes in helping us to understand global climate change by providing signals of regime shift and adaptability of past ecosystems to environmental change. **Samantha Allcock** (Plymouth University) explored the use of palaeoenvironmental and archaeological records as a means of examining human-climate relationships in Cappadocia, central Turkey. The final presentation of the day was given by **John Dearing** (University of Southampton) on the use of rising variance to detect early warning signals of a regime shift in the Erhai lake, Yunnan province, China.

Climatically-induced vegetation change was the theme of this year's Wiley lecture given by **Tom Webb III**. This focussed on the importance of climate as a driver of vegetation change and the role of palaeoenvironmental and palaeoecological data in shedding light on the responses of vegetation to climate change during the Holocene. Such research will not only allow us to better understand how vegetation has changed in the past in response to climate, but also how it may change in the future.

Day 3

The final day began with an informative poster session, which covered a wide range of thought-provoking topics. This was followed by a discussion on science-media-public interactions. The theme of 'human-climate-ecosystem interactions' continued before concluding with a session based on the Anthropocene.

Throughout the ADM, many touched upon experiences in conveying scientific information to the public and the media so, appropriately, the final day began with **Kathryn Adamson** (Manchester University) and **Tim Lane** (Durham University) providing an outlet for discussion on this matter. The challenges, benefits, and cautions of communicating accurate but digestible information to the public were debated and the new climate science website, *Climatica*,

was presented. This interactive site facilitates the interaction of academics, the public and the media and was very well received by the delegates.

The days presentations began discussing the merits of combining palaeo-records with other sources of information: **Ke Zhang** (PLUS) focused on the use of palaeoenvironmental analysis of lake sediments in combination with socio-economic and climate records to extend the timescale and range of ecosystem services within the lower Yangtze basin. **Helen Shaw** (Lancaster University) then discussed traditional management through her talk on palaeoecological and historical contributions to understanding sustainability, resilience and ecosystem services.

Isotopic climate records were presented by **Hazel Reade** (Cambridge University) through her analysis on Bargary sheep tooth enamel, detecting changes in seasonality of climate from Northeast Libya. **Virgil Dragusin** (Romanian Academy) continued this theme by presenting a complete speleotherm Holocene record of climate variability in SW Romania, detecting human activity.

Lake sedimentary records were the focus of **Helene Ducrotoys** (Aberystwyth University) palaeocological and biomolecular investigation of Sorghum bicolor domestication. **Frank Mayle** (Edinburgh University) also looked at lake records, concentrating on the alteration forest composition by early cultures in pre-Columbian Amazonia. **John Carson** (Edinburgh University) continued with pre-Columian Amazonia, this time focusing on the identification of different strategies for maize agriculture employed by distinct cultures at different times, in a landscape that is now unproductive. **Joseph Williams** (Kansas State University) concluded this session by presenting environmental and human activity changes in the Cochabamba Basin, Boliva.

The final session of the ADM provided the much-awaited platform for a discussion on the 'Anthropocene'. This commenced with **Phil Gibbard** (University of Cambridge) looking at the Anthropocene as a formal division of geological time. He acknowledged man as a geological agent, but stressed the need for an unequivocal global stratigraphical signature and investigated the utility of this division. **Mike Ellis** (BGS) introduced the iARC: the international Anthropocene Research Community, currently being developed to map the Anthropocene both temporally and spatially and highlighted the fundamental role that humans play as a geological agent. The Anthropocene viewed from the underworld was then investigated by **Ian Fairchild** (Birmingham University) who highlighted the potential use of spelaeothem data in defining the base of the Anthropocene. He outlined the many proxies that could arguably be used, with the global peak in the radiocarbon signal in the 1960s from the atmospheric nuclear tests being an obvious candidate. Attention was then focused to the Anthropocene in Western Australia as **Esme Webb** (Edith Cowan University) outlined the problems with identification in this area. The final speaker, **Tony**

Brown (PLUS), considered whether there is a collective belief amongst earth scientists that part, or all, of MIS 1 will be different to previously forced interglacials within the Pleistocene and whether it is possible to locate a consistent and sustainable boundary in the stratrigraphic record to use as the base of the sedimentary record. He concluded by looking at the implications that this definition could have for the Holocene.

Thanks to Pete Langdon for organising such an interesting meeting in the beautiful, apt location of the New Forest and also to the members of PLUS for assisting throughout. The varied, simulating schedule of this ADM provided a superb way to begin 2012.

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