
CAM QUA

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The **Stage 3 Project** from **Start to Stop** in **Ten Minutes**

A retrospective at the publication of the Stage 3 monograph

It was late in the year 1995 that Nick Shackleton and I decided to celebrate the rebirth of the Quaternary sub-department as the Godwin Institute with a Godwin Conference on Oxygen Isotope Stage 3. There, the recently discovered high-frequency climate swings would be discussed and the question raised whether that odd climate might have to do with the extinction of the Neanderthals around 30,000 years ago. The dramatic climate and the fall of the Neanderthals were hot topics at the time and would surely bring an interdisciplinary audience.

The themes of the Godwin Conference were straightforward: reconstruct the changing glacial environments and compare them with the patterns of human settlement in Europe, but its modus operandi was experimental. We wanted to bring together graduate students, postdocs and other researchers of the latest generation, hoping to lure them into serious consideration of one or both main topics. Our goal was to design a research project to use new and

inter-disciplinary ways of studying glacial environments and the ways whereby palaeolithic humans in Europe adapted to those conditions. We promised a selected set of speakers that this time they would NOT have to publish their lectures if, instead of telling us what they had done already, they would raise new research issues from their own and contiguous fields, and so inspire the audience to view matters from more than one scientific point of view at once.

Thus, in June 1996, eighty people attended the first Godwin Conference of whom, at the end, a large group gathered in a small conference room to plan a Stage 3 Project. There a workable set of objectives was drawn up for a two-phase programme. In its first phase on palaeo-climates and palaeo-environments a set of high-resolution simulations for climate and plant cover would be constructed using existing data for input in the models and to verify the output. In phase two on the human responses to glacial climate changes, two databases, also using

existing data, would be compiled for all dated middle and late Palaeolithic sites in Europe and for the ecology of mammalian food resources. Both would be used to compare the human settlement of Europe with the shifting glacial environments and resources.

Volunteers, ultimately numbering more than thirty and ranging in expertise from human physiology to geophysics, flocked happily to the project, most of them bringing their own research resources. The first phase of the Stage 3 Project was underway, simulating and testing high-resolution warm and cold climate events and plant covers.

Four years went swiftly by, linked by ad hoc workshops and annual meetings for planning and evaluation, each meeting marked by a more satisfying level of lively interdisciplinary dialogue and closing with a traditional "Stage 3 college dinner". Then, early in 2000, the data available for construction and validation of the simulations ran out, and we had to

face the analysis and publication of Phase One results. At a workshop in early July enthusiasts drew up a list of twelve manuscripts covering for instance the history of the Fennoscandian ice-cap, sea-ice cover and sea-surface temperatures and much else that merged into palaeoclimate simulations of one warm and two cold climate phases with their vegetation. The set, initially as drafts, would constitute the underpinnings of Phase Two. Of those eight that covered most of what we planned in that heady July 2000 workshop were eventually published in 2001 and 2002. Unfortunately, the intended multi-aspect synthesis of the mid-glacial landscapes fell victim to an unexpected return to subject provinciality.

Phase Two was formulated that same year at a September workshop. There, archaeologists and mammalian palaeontologists planned the study of human reactions to climate changes and resource variations with the aid of chrono-archaeological and mammalian ecology databases, and laid out a series of publications. However, this plan soon proved unworkable, in part because it would scatter the evidence and its interpretation across many journals, and partly because of a wholly unexpected phenomenon. Where the vivid multi-disciplinary discussions of the early years had promised an equally vivid interdisciplinary series of reports, the reality was a set of palaeo-environmental papers that focussed mainly on the core fields of their authors. The papers understandably

used professional languages that might as well have been Turkish or Swahili to archaeologists. Obviously, the application of the Phase One work to Phase Two was not going to be as simple as we had thought.

Two things were obvious. First, the publications of Phase One needed re-focussing and translation into a common language before they could be applied to the objectives of Phased Two. Secondly, only a book that addressed palaeo-environmental results and archaeological studies side-by-side would enable readers to obtain an overview of what we had achieved, to make up their minds of their value and to engage the issues we raised.

This book, edited by Tjeerd van Andel and William Davies and titled "Neanderthals and Modern Humans in the European Landscape of the Last Glaciation - Archaeological Results of the Stage 3 Project", saw the light as the year 2003 turned into 2004. Its emphasis on the use of environmental modelling and on interdisciplinary comparisons has raised a great many questions, some new and others formulated more precisely than previously. There is, for instance, the long-standing conflict between many palynologists who see the landscapes of mid-latitude Europe as a treeless and barren tundra and the mammalian record that speaks of the numerous herds of large herbivores that deny this very unproductive landscape. It seems that the second is winning. Another example: we now feel able to

propose with some confidence that the settlement patterns of Neanderthal and early modern (Aurignacian) humans were influenced in similar ways by climate changes and that both species were limited by the 50th degree parallel. And indeed, human physiological studies indicate that the view that Neanderthals were especially cold-adapted is almost certainly untenable. Later modern humans (Gravettians), in contrast, preferred the conditions of the high Arctic, surely because technical and social advances enabled them to make the seasonal migrations that exploitation of high latitudes requires.

Not in the mainline of our work but interesting nonetheless was the recognition, nearly simultaneously achieved by Stage 3 members and our Norwegian and Russian colleagues that between 60,000 and about 27,000 years ago northern Europe above the Arctic Circle was almost free of ice. If we are right, and in northern Russia human settlement in a mixed landscape of boreal woodland and tundra suggests that we are, a large region hitherto ignored is open for exploration.

When the Stage 3 Project began, our inevitable use of existing data for experimental applications implied that we might hope for many and better questions, but that hard answers would certainly be few. And so it has come to be.

Tjeerd H. van Andel
(Stage 3 Coordinator)

Neanderthal and Modern Humans in the European Landscape of the Last Glaciation: Archaeological results of The Stage 3 Project is published as a Monograph of the McDonald Institute of Archaeological Research of Cambridge University and can be purchased from Oxbow Books (Oxford and New York).

The Stage 3 website at: <http://www.esc.cam.ac.uk/oistage3/Details/homepage.html> contains a list of publications, the chrono-archaeological and mammalian data bases and the Penn State climate simulations. All can be downloaded, but please cite the Stage 3 Project and/or individual authors as sources.

ANNUALLY-BANDED RECORDS IN THE QUATERNARY

QRA Annual Discussion Meeting

7-9th January 2004

The Annual Discussion Meeting of the Quaternary Research Association took place at the University of Wales, Bangor, between 7-9th January. This meeting, which was co-sponsored by the Marine Studies Group of the Geological Society of London, focused on the theme of annually-banded records. The topic offered wide scope for a range of talks which could broadly be grouped into those covering varved sediments in both marine and lacustrine environments (8 talks), and those looking at climate records in corals (one talk), terrestrial carbonates i.e. speleothems and tufas (four talks), ice cores (one talk) and tree rings (four talks). One whole session was devoted to the potential value of marine molluscs, especially long-lived species such as *Arctica islandica*, as archives of annually resolved records of climate variability. This set of four talks was preceded by a keynote lecture (the Sir Kirby Laing Lecture) entitled "Molluscan sclero-chronology: practice, pitfalls and potential" given by Doug Jones (Florida Museum of Natural History), one of the early pioneers of this technique. In fact, this was one of nine keynote lectures each

given by leaders in their respective field: Alan Kemp (inter- and intra-annual records of climate change from laminated sediments), Sandy Tudhope (tropical climate variability from annually banded corals), Takeshi Nakagawa (Lake Suigetsu), Mike Baillie and Keith Briffa (dendrochronology), Sigfus Johnsen (Greenland ice cores), Ian Fairchild and Andy Baker (stable isotopes and lamina records in speleothems).

Another keynote address was the John Wiley Lecture, this year given by Konrad Hughen (Woods Hole Oceanographic Institute). He spoke eloquently about "Synchronous high and low-latitude North Atlantic climate change during the last deglaciation". The meeting was therefore fully international and the talks were all of high standard. Time had been allocated to allow 3-4 minutes for each person to discuss their poster. This was very effective and definitely encouraged more careful scrutiny of several posters. Also present at the Poster session were representatives from Cox Analytical and New Wave Research, who were keen to demonstrate some new pieces of equipment, including a new MicroMill sampler for isotopic analysis. As I could see no

prices listed, I presume they must have been very expensive!

It was good to see a completely different set of faces at this meeting - I probably knew only about half of the attendees. Because of the interdisciplinary nature of the meeting, it is likely that many of these people had also not met before. It was an excellent meeting, both scientifically and gastronomically and I certainly learned many new things, not least that the acoustic quality of Stradivarius violins may well result from the nature of the growth bands in the wood from which they were made! I also learned that the oldest known specimen of *Arctica islandica* - 267 years (as mentioned by James Scourse in a recent QDG) is being challenged by a specimen sectioned by a German group that may have 340 bands. Yes - but are they all annual - an issue that will no doubt be addressed at the workshop that was to be held the day after the meeting. Whatever the outcome, James Scourse and the other organizers are to be congratulated on such a stimulating meeting.

Richard Preece, Zoology

QRA Isle of Man and Northwest of England

The QRA Annual Field Meeting and AGM will take place between 19th-23rd April, 2004.

Venue: Isle of Man and Northwest of England

Organiser: Richard Chiverell, Andrew Plater and G. Thomas

Contact: Richard Chiverell

Email: R.C.Chiverrell@liverpool.ac.uk

Full details of the themes of the field meeting and registration details may be found online at <http://www.qra.org.uk/AFM2004.htm>

Congratulations

Geological Society of London 2003 honours include GIQR member and Quaternary geologist

Harry Elderfield was awarded the Lyell Medal of the Geological Society for landmark achievements in the field of oceanic chemistry. The Lyell Medal is awarded in recognition of breadth and depth of contribution to geological science, and is regarded very highly by the Society. The Lyell Medal is normally given for contributions to 'soft' rock studies while the Murchison Medal (of equal status) for contributions to 'hard' rock studies.

Harry Elderfield is a member of the Earth Sciences Department and the Godwin Laboratory. In his early career, Harry worked on the behaviour of trace metals in the oceans and their sediments. He became one of the very first low-temperature geologists to recognise how radiogenic isotopes could be used to solve the problems of marine geochemistry, developing the seawater strontium isotope curve for the Cenozoic. He coined the term 'strontium isotope stratigraphy' to describe the application of this curve to chronostratigraphy - a technique now widely used for empirical dating of marine sediments. His current interests include defining chemical proxies from biogenic carbonates and using them to understand the ancient ocean.

In particular, he has pioneered the development of foraminiferal magnesium thermometry, an increasingly accepted method for the estimation of past ocean temperatures.

John Lowe, Quaternary geologist of international renown for research in the fields of palynological stratigraphy and geochronology, has been honoured with the award of the Geological Society's Coke Medal. The Coke Medals are awarded for scientific contributions to geology, as is the case with the Lyell and Murchison medals, but may also be given for significant service to geology, for example through administrative, organisational or promotional activities benefitting the community, and may be extended to include scientists whose training and interests are outside the main fields of geology. (Two Coke Medals are awarded annually, the second in 2003 going to Mike Bickle, of Earth Sciences.)

John Lowe is Professor of Geography and Quaternary Science at Royal Holloway. In the award of the Coke Medal, his diverse contributions - both scientific, administrative, pedagogic and editorial - are given fitting recognition.

NEWS

The QPG welcomes a new member, Maria Angelica Godoi Millán. Maria hails from Punta Arenas, Chile, where she has worked as a glaciologist at the Universidad de Magallanes. She is set to begin a PhD project researching the sedimentology of lakes and fjords of southern Patagonia. ¡Bienvenido!

A very warm welcome also to Andrea Balbo, who begins a PhD to investigate geomorphology and geoarchaeology in Istria, Croatia. Andrea recently completed a Masters course in which he studied the geomorphology of the Rhône valley. He will be based in archaeology.

The Godwin Laboratory anticipates the arrival of the Heussers on the 23rd of January. Regular visitors to Cambridge, the Heussers will certainly be given a warm welcome.

Queen's University Belfast has been awarded £6.5 million to establish a new Centre for Chronology and Environment. A new AMS facility is planned within the next two years. By the summer, a separate pot of money will have bought a new electron microscope enhanced by a new WD probe kit, worth £90,000.

50 years ago...

An extract from the 1953-1954 annual report of the sub-department of Quaternary research:

"Members of the Sub-department played a substantial part in arranging and conducting a visit between 25 and 29 June 1954 to East Anglia of a group of distinguished Dutch Quaternary geologists. On the Norfolk coasts many exposures of glacial deposits were examined and Miss Duigan demonstrated her results of palynological examination of Cromer Forest Bed. .. [At Hoxne] the visitors expressed the view that the establishment there of a lengthy vegetational sequence effectively related to the Mindel-Riss interglacial and to a Late Mid-Acheulian industry gave for the first time a secure basis for aligning the Quaternary deposits of the Netherlands with those of this country. Here and elsewhere during the excursions Mr West and Mr Donner were able to demonstrate the technique of determining the direction of ice-flow by measuring pebble orientation in the boulder clay"



Godwin, West, Duigan, Spencer, Hollingsworth, Cornwall, King, Hey, Donner, Pannekoek, Florschütz, van der Vlerk, van der Heide and Brouwer at East Runton, June 1954. Photo by B. Farrell.

More photos of this excursion, as well as the full history of the sub-Department as documented in the annual reports, are found on the Godwin Institute webpages at www.giqr.group.cam.ac.uk.

Those were the days!

Diary Dates, Lent Term 2004

January

GEOG Thursday, **January 29**, 4.15pm. Seminar Room, Geography Department. "Understanding the processes of climate variability and change using models and observations" *Julia Slingo (University of Reading)*

QDG Friday, **January 30**, 8.30pm. "Submarine geomorphology and stratigraphy of river valley systems on the English Channel shelf" *Sanjeev Gupta (Imperial College London)*

February

QDG Friday, **February 20**, 8.30pm. "Multiple-proxy evidence for Mediterranean climates in the British early Middle Pleistocene" *Ian Candy (Royal Holloway)*

SPRI Wednesday, **February 25**, 4.30pm. "Dynamics of glacier surges measured by ERS SAR interferometry and feature tracking" *Dr. Adrian Luckmann (University of Swansea)*

March

SPRI Wednesday, **March 3**, 4.30pm. "Hydrology and dynamics of High Arctic ice masses and their response to climate change" *Dr. Peter Nienow (University of Glasgow)*

SPRI Wednesday, **March 10**, 4.30pm. "Exploring the hidden depths beneath Antarctica's floating ice shelves" *Dr. Adrian Jenkins (British Antarctic Survey)*

QDG Friday, **March 12**, 8.30pm. "From dipoles to icebergs: Quaternary magnetism" *Barbara Maher (Lancaster)*

SPRI Wednesday, **March 17**, 4.30pm. "Holocene history of the George VI Ice Shelf, Antarctic Peninsula" *Dr. Mike Bentley (University of Durham)*

QDG talks to be held in West Court, Clare Hall, Hershel Road.
Enquiries contact: R.C. Preece, (3)36666, (r.c.preece@zoo.cam.ac.uk)

SPRI seminars to be held in the Scott Polar Research Institute Lecture theatre.
Enquiries contact: Colm Ó Cofaigh, (3)36563, (co232@cam.ac.uk)

Deadlines: Copy for the next issue of CAMQUA should be submitted before the start of next term.

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