



**THE OPEN UNIVERSITY GEOLOGICAL SOCIETY
GOGLEDD CYMRU - NORTH WALES
BRANCH NEWSLETTER**



Volume 8

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Branch Organiser's Bit

Welcome to the first newsletter of 2006. The Branch AGM took place on Saturday 4th February. It was very good to welcome our new Society Chairman Joe Jennings to the meeting. The Branch Committee from last year were elected for another year. The committee for 2006 is therefore :-

Rachel Atherton	Branch Organiser
Tony James	Newsletter Editor
Wendy Owens	Treasurer and Web Master
Lyn Relph	Member
Sue Hughes	Member

The talk following the AGM was given by Peter Appleton. Peter has extensive experience of the area around (and under) the mines around Minera (near Wrexham). The talk was excellent, illustrated with lots of informative photographs. It put much of the geology and industrial history of the area into context. Everyone commented on how much they enjoyed it. Many thanks to Peter.

If you do not currently receive e:mail reminders of events/ field trips and would like to please email me at Gogledd.Cymru@OUGS.org, and I will add you to our distribution list. Similarly if you no longer wish to receive this information electronically let me know.

Wendy has been putting a lot effort into bringing the Web page up-to-date. She would welcome suggestions and comments on the site, particularly anything that could be included -e.g. photographs of the local area.

Field trips for 2006 are being finalised. If you have suggestions for field trips or other events including a speaker at next year's AGM please let one of the committee know so that we can follow it up. Finally we are part of the organising committee for the 2007 Symposium, which will be held at Lancaster University. Volunteers to help with organisation either before and/or during the event are welcome.

We look forward to seeing you at field trips.

Rachel
(Branch Organiser)

Palaeogeography and Palaeobiogeography: Biodiversity in Time.

April 10-13th 2006

Hosted by the National Institute for Environmental E-Science.

This meeting aims to broaden scientific understanding of the evolution of the Earth's biodiversity at a range of spatial and temporal scales, by facilitating collaboration among palaeogeographers, palaeobiogeographers and modern day geographers and biogeographers. The meeting will consist of a day of talks from invited speakers, four workshops and poster sessions.

The meeting will take place at the Centre for Mathematical Sciences, University of Cambridge. More information and online registration can be found at

<http://www.tethys.org.uk/biogeography/>

The conference organisers can be contacted directly by e-mail. We look forward to a productive and fun meeting in Cambridge.

Dr. Paul Upchurch (p.upchurch@ucl.ac.uk)

Dr. Alistair McGowan (a.mcgowan@nhm.ac.uk)

Claire Slater (c.slater@nhm.ac.uk)

Anglesey

27th – 29th October 2006

The North West and Gogledd Cymru branches invite you to a post-exam weekend staying at the Gladys Hotel, Cemaes Bay with Leader Dr. Ros Todhunter

The varied geology makes it difficult to choose but the itinerary should include sediments, metamorphics, minerals and structures.

More details from Chris Arkwright.

The Carmel Head Thrust

On Anglesey, the fault systems run NE to



Figure 1.

are not part of the Gwna Melange. Limestone clasts are the first to be deposited with a transition to Quartzite. The limestone clasts tend to dissolve and leave pockets. These deposits lens out quite quickly.

Rhyolite was extruded onto the sea floor where it shattered dense rocks.

This leaves structures analogous to pillow lavas but in acidic rather than basic lava. The shattering effect is clear in fig. 1 above.

The rhyolite sank into the soft mud leaving an unusual contact

(marked with a dashed line) Fig 2 below.

SW, except The Carmel Head Thrust System to the north of the island, which runs East to West. This system post-dates the NE-SW system and has a steep northerly dip. The rocks belong to the Monian super group and are green in colour due to the presence of the minerals chlorite, epidote, green malachite and chalcopyrite.

There are many mafic dykes of the Tertiary era within the Mona Complex, including the largest in the UK. The dykes and the country rocks have the same cleavage indicating that the thrusting was post dyke emplacement.

To the south of the Carmel Head Thrust are Ordovician rocks. The bedding is overturned from fining up bedding to a coarse deposit with large clasts, this being deposited in a high-energy environment, possibly a cliff failure due to syn-sedimentary tectonic activity. The clasts

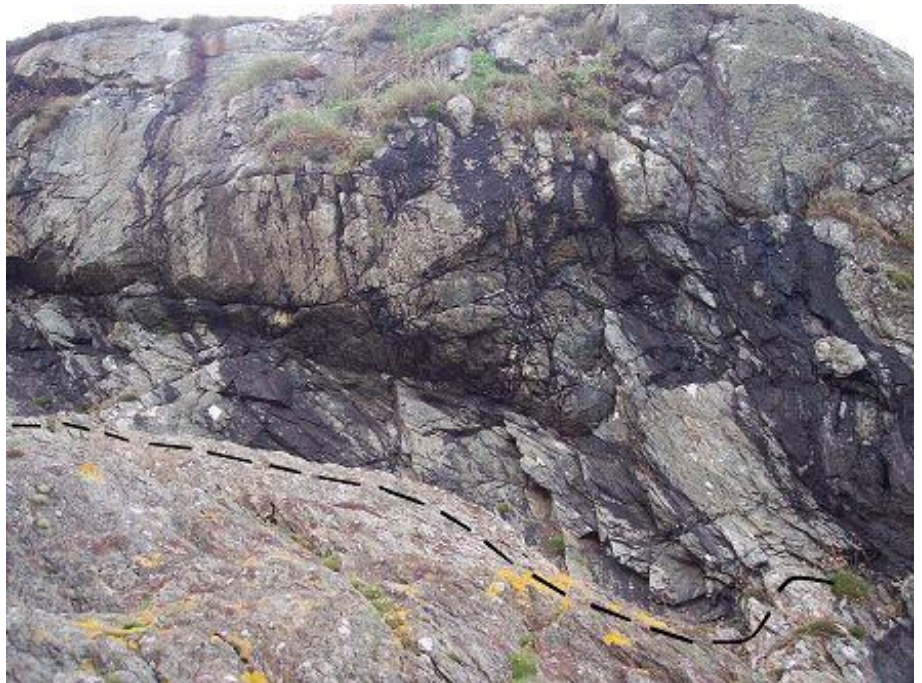


Figure 2.

Lyn Relph
(photos courtesy L. Relph/T.James.)

The Behaviour of the Welsh Icecap

It is always worth looking out for and attending your local geological group lectures. The February Shropshire Geological Society lecture by Dr Neil Glasser of the Aberystwyth centre for Glaciology was a real treat!

Neil began by introducing us to the ice core records of Quaternary climate, continued with the remote sensing of former ice sheets leading to glacier dynamics and finished with an account of the application of these research areas to the Welsh Icecap.

800,000 year old oxygen isotopes from the ice cores of Antarctica have displayed cycles of rapid warming and slow cooling. With large scale remote sensing using tilt and map evidence, ice flow lineations can be detected. Satellite images have enabled glaciologists to use present day Antarctica as a model for past glacier dynamics and thermal regimes.

Ice streams have been identified and seem to hold a key to the understanding of the stability and response of ice sheets to climate change and ocean circulation. Although they account for only 10% of the volume of the icesheet they account for 90% of ice mass lost from the system. Ice streams are sizeable features, up to 50 kilometres wide, 2000 metres thick and hundreds of kilometres long. Some flow at 20 to 100 metres per year from the interior ice and others have speeds of over 1000 metres per year and most of the ice leaving the ice sheet passes through these. Ice streams generally form where water is present, but other factors also control their velocity, in particular whether the ice stream rests on hard or soft rock, deformable sediments. At the edges of ice streams deformation causes ice to recrystallise making it softer and concentrating the deformation into narrow bands or shear margins. Crevasses result from rapid deformation and are common in shear margins.

Ice streams are identified also by convergent flow patterns with abrupt lateral margins and often comprise subglacial bedforms (drumlins and megascale glacial lineations) with high elongation ratios. They seem to develop in subglacial troughs often bounded by higher elevations showing no ice flow indicators. The Antarctic ice stream patterns shown by Neil reminded me of drainage patterns. The rapid flow seems to facilitate deglaciation. It is difficult to show these patterns here but if you are interested, a flow map

can be seen at www.antarctica.ac.uk/BAS.

Where these ice streams once operated can often be delimited by the unique signatures which they leave behind in the sedimentary record. Large-scale lineations, in particular, found carved in parallel sets beneath ice streams tell us a great deal about the extents, limits and flow dynamics of a former glacier. These streams are particularly important, because they provided an outlet for the majority of ice and sediment carried by the ice sheets in the past.

Neil explained that his department had questioned whether, using this technology and modelling, they could identify ice streams over Wales, reconstruct the directions of flow and estimate the thickness of ice. He hinted at the controversy surrounding these ideas and noted several geologists who had previously estimated the maximum extent and flow directions. He illustrated how, by draping elevation models and Landsat imagery, rock cored linear features were revealed. This was particularly interesting for me as he used the Tanat valley/Four Crosses area, close to my home, to illustrate.

Two major ice-flow events were identified. The oldest phase of ice flow (Event I) is characterized by ice flowing from an ice dispersal centre situated over the higher terrain in north-central Wales and by ice thick enough to cover the mountain summits. At this time the interior of the ice cap is inferred to have been dominated by cold-based ice. During the growth of the Welsh Ice Cap it became confluent with the British-Irish Ice Sheet. The Welsh Ice Cap at this time was again sufficiently thick to submerge the highest mountain summits. The youngest detected phase of ice flow (Event II) was marked by an abrupt change in the dynamics of the Welsh Ice Cap. During Event II the Welsh Ice Cap was drained by at least four ice streams, which followed major troughs in northern and eastern Wales.

In conclusion, it seems that geomorphology helps to explain how former ice sheets were configured. It suggests that major ice flow events do not necessarily follow the published literature and four ice streams can control the collapse of major ice sheets. There were many interesting, thought provoking questions asked after the lecture and no doubt Neil will be invited back to the Society to give the next instalment. I look forward to it.

Field/Events list for 2006

Date	Location	Contact
March 18th or 19th	Anglesey Parys Mountain Underground visit (1)	Rachel Atherton
March 25 th	Wrexham Science Fair (with NWGA)	Tony James
April 1st or 2nd	Anglesey Parys Mountain Underground Visit (2)	Rachel Atherton
May 6th or 13 th	Oswestry Llynclys Quarry, Oswestry (dolomitic limestone)	Sue Hughes
June 18th	Llanrwst Gwyddy Forest Miners Trail	Rachel Atherton
July 9th or 16 th	Anglesey Llanwddyn Island	Wendy Owens
Sept 2nd or 9 th	Flintshire Pant Quarry (Carboniferous Limestone)	Wendy Owens
Oct 1 st	Chester Revision Day.	Hilary Tatton NWe/GCy
Oct 27-29	Anglesey Post Exam Weekend: Ros Todhunter	Chris Arkwright NWe/ GCy
NWGA trips:-		
April 26 th Wed	The Glaciation of N.Wales – Dr Neil Glasser	Contact Jonathan Wilkins
Liverpool GA April 2 nd	Field trip to Tegg's Nose	Contact Joe Crossley
Manchester GA March 25 th	Field trip to Scunthorpe	Contact Jane Michael

Announcements

The membership secretary has asked me to remind members that any change of address should be sent to her (Penny Widdison e-mail:), this will ensure that a single database can be kept as up to date as possible. Please use the Giftaid on the renewal notice for membership – this will enable the OUGS to reclaim some of your tax, and put it to a better use.

Your committee for 2006 is

Branch Organiser	Rachel Atherton
Committee Member	Sue Hughes
Newsletter Editor	Tony James
Webmaster/Treasurer	Wendy Owens
Committee Member	Lyn Relph