Cymdeithas Daeareg Gogledd Cymru

North Wales Geology Association

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Issue No 69 **NEWSLETTER** **May 2012**

Chairman's Message:

Spoiler Alert.....

It seems that the NWGA appears in a list of local geological societies that is maintained by the British Geological Society (sic), and consequently I get contacts, maybe once a year, from folk who are fishing for ideas to make television programmes featuring geology. Keith hasn't mentioned being inundated with aggrieved messages following my condemnation last time of the Great British Countryside, though I did get a comment from a second-year undergraduate at Camborne School of Mines, that he was disappointed too.

Well, back in March I received an email from a lady who was working on a programme for a well-known BBC series that I shall call "Interface" (think of the bit where sea meets land) for now, who wanted to feature British cliffs and the rocks that make them. I was directed to a non-existent attachment. Intrigued, I pointed out to the author that I hadn't received any such attachment, and was offered a single-page jotting that summed up Welsh cliffs as follows: "...slates that were once mud from the bottom of a deep (and often smelly and stagnant) sea..... Weirdo fossils, if you're lucky".

Wales excludes Pembrokeshire, apparently, but it is really exciting, featuring Carboniferous Limestone and Coal Measures. Frankly, I was disappointed and pointed out to my correspondent that we did a lot better than that; had she considered metamorphic Anglesey, rhyolite, diorite, granite, pillow lavas et al? She was a bit sniffy then, but the promise of some hand specimens cheered her up and she became quite enthusiastic when I sent her a picture of the examples that I was prepared to loan for use in their geo-montage of the bedrock map of Britain, to be conducted from the safety of a studio in Yorkshire. She then handed the reins of the project to somebody else and I have heard not a dicky-bird since; it serves me right I suppose.

It is my abiding hope that by asking someone who knows the terrain, the production team received some ideas with real merit. My correspondent certainly liked the locations, "These are exactly the kind of sites that we would like to represent, thank you", and I will enjoy the episodes of "Interface" where the transport and quarrying history of Penmaenmawr, the granite quarries of Trefor, or the cliffs of South Stack are featured. Treated carefully, there are some engaging themes among those. You heard it here, first, but I shall not be holding my breath.

This edition of our Newsletter publicises a number of well-researched field meetings for your interest and enjoyment, one or two a little farther afield than usual, so I ask you to support these meetings as enthusiastically as the last indoor meeting (I was absent - is there a message here?). When hearing horror-stories about university courses in geology where fieldwork is optional (or even non-existent) I can only shudder and point out that ONLY the study of rocks in the field leads to real understanding, and I look forward to seeing you in the great outdoors.

Jonathan Wilkins

Welshpool's Geological Heritage Project:

An exhibition of the Powysland fossil collection and Joseph Bickerton Morgan, plus associated geological events.

The central event of this project is an exhibition in the Powysland Museum, Canal Wharf, Welshpool. A collection of over one thousand fossils was once held by the old Welshpool Museum but this was sent on loan to the National Museum of Wales in Cardiff fifty years ago.

Trinucleus concentricus **(originally called *Salterolithus caractaci*), a blind trilobite. The fringe pits are probably evidence of a sensing mechanism instead of eyes. Upper Ordovician, Welshpool. Extinct at the Ordovician-Silurian boundary. Collected by Joseph Bickerton Morgan. Approximately 2 cm.**

Assisted by the National Museum, the Mid Wales Geology Club has made a selection from these fossils, and this is displayed and explained in eleven cases at the museum in Welshpool during March to May 2012. The Club has also prepared a series of posters describing the life of Joseph Bickerton Morgan, an assistant baker living in Victorian Welshpool. He helped to arrange the fossils and contributed many of his own. Tragically he died of tuberculosis in 1894 at the age of only 34, just after completing in a single year a geology degree at the Royal College of Science in London (a forerunner of Imperial College) where he won the prize for top student. The exhibition at Powysland Museum was opened by the Earl of Powis in March.

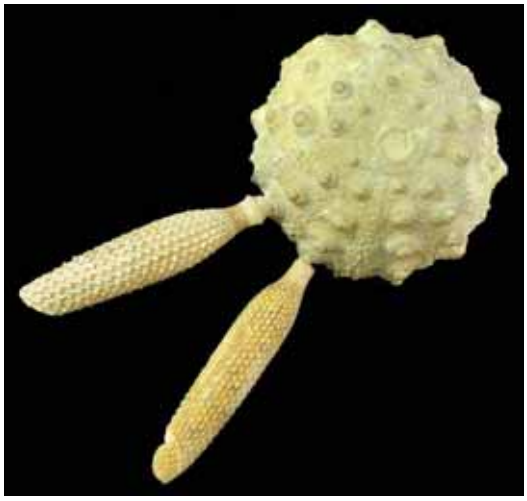
Thamniscus antiquus, **bryozoan, Lower Silurian, Middletown Hill near Welshpool. A completely new species discovered by Joseph Bickerton Morgan. The whole specimen is only 2 cm across and was figured in a paper in the Geological Society Journal in 1885. This close-up is 6 mm across [note mm, not cm]. Each of the hundreds of little 'rods' housed one of the tiny colonial creatures.**

Mid Wales Geology Club has also produced a leaflet on the Building Stones of Welshpool. This is being widely distributed locally but can also be seen on the club web site at www.midwalesgeology.org.uk. An inaugural walk around this short geological trail, led by Dr John Davies,

formerly regional geologist with CCW, will be held on 27 May.

***Nereites cambrensis*, trace fossil, Lower Silurian, Lampeter, Ceredigion. This actual specimen is the holotype (the designated type specimen) for a walking trace – or perhaps resting trace – of this creature, and it was figured as a woodcut in Murchison's famous Silurian System, 1839. Approx 5 cm.**

A leaflet on the life of Joseph Bickerton Morgan can also be seen on the web site. Several evening talks are being held in Welshpool during the exhibition, and the Montgomeryshire Museums education service is delivering geological activity sessions at ten schools. Welshpool's Geological Heritage Project is a good example of a collaborative project between a local geology group, the provincial museum and the national museum, and it has been supported by the Heritage Lottery Fund, which contributed £4650 towards the costs.



***Hemicidaris*, echinoid, Upper Jurassic, Wiltshire, with two of its many matching spines. Approximately 6 cm.**

This is the second major event for Mid Wales Geology Club in recent years. In September 2007, together with the Welsh Mines Society, the Club arranged a large exhibition in the Minerva Arts Centre, Llanidloes. Called 'Land Of My Fathers'; this dealt with the geology of the Welsh Basin and the history of mining in the Central Wales Orefield. Around three hundred people visited the one-week exhibition, and more came to the talks, walks and schools activities.

The exhibition finishes on the 29 May. Note the museum 'winter' opening hours: Mon, Tues, Thurs, Friday 11-1 and 2-5. SAT 11-2. Closed Wed & Sun.

Colin Humphrey

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An interesting aside (perhaps?) is that the *Nereites cambrensis* specimen figured above was the main reason for the visit to the NMW reported elsewhere in this article – at least as far as your Editor is concerned. One thing that is now apparent is the fact that the fossil and the reproduction figured by Murchison are mirror images. Whether that is simply a hangover from reproduction techniques of the day, or indicates that there may have been both a part and counterpart of this specimen is an interesting question to be considered further (watch this space).

Artisanal Quarrying for Building Stone: Thoughts for the Planning Regime

Two recent visits to former quarry sites in the historic English market towns of Ripon and Ludlow have raised some concerns regarding the planning system, and our built heritage. The character of our towns, particularly the rural market town, is defined in a very real sense by the geology. For reviews describing how this has manifested itself in:

1. Shropshire, in general, read Jenkinson, 2008, available on line at http://www.shropshiregeology.org.uk/sgspublications/Proceedings/2008%20No_13%20006%20Jenkinson%20Vernacular%20building%20stones.pdf) and in

2. Ludlow, in particular, read Rosenbaum, 2007, available on line at: http://www.shropshiregeology.org.uk/sgspublications/Proceedings/2007%20No_12%2005-38%20Rosenbaum%20Ludlow%20building%20stones.pdf

3. Welshpool, attend the forthcoming Mid Wales Geology Club Walk on the 27th May www.midwalesgeology.org.uk

Building stone, won from quarry sites in and around settlements is a valuable commodity. The rocks dug (be they Carboniferous Limestone in Dyserth, Conwy Castle Formation sandstones in Conwy, the Aymestry Limestone of Ludlow, or the Lower Magnesian Limestone of Ripon), form the very fabric of our homes, our shops and the infrastructure (roads, bridges etc) on which we depend.

As time has progressed however building with locally won stone has become rarer and rarer. The rise of steel columns, concrete lintels, and imported (and often poor quality) brick has left quarry sites abandoned as the economics of scale associated with mass production leave behind the small independent quarry operations. Sites, after being abandoned, may be reclaimed by nature, or often by man (sometimes for gardens – often for landfilling).

Whilst our characterless out of town shopping centres, and our modern brick and concrete houses can be repaired with replacement manufactured materials, this is not the case for our older, traditional stone and masonry built houses. In many of our more highly regarded market

towns the owner will find himself living in a Conservation Area, or possibly even in a listed building. The Planning Authority in such cases may well operate strict rules regarding the need for repair with materials that "match" the original.

There are, of course, opportunities within this system for recycling of the stone within the old housing stock. Reclamation and salvage businesses can and do charge substantial sums of money for the best reclaimed local stone. Nevertheless it is inevitable, that with already won reclaimed stone being a severely restricted resource, it will become necessary to undertake repair, maintenance, and even new build, where permitted, using newly won stone and masonry. In cases where all the local quarries have closed, and environmental constraints (and yes, sometimes an element of "nimbyism") make it all but impossible to reopen old quarries how can this circle be made square?

The borderland market town of Ludlow is a delightful honey coloured town built primarily from the Silurian Aymestry Limestone. Much of the stone was worked from a series of now long abandoned quarries which run along the western bank (*Whitcliffe*) of the River Teme between the Dinham and Ludford Bridges. These are now popular walking trails, and form a much loved, and much protected local ecosystem. The prospect of these quarries, or any other close by, ever being worked again, seems a long way off.

The adopted "solution" to this, somewhat bizarrely it seems, is to import a "similar", (but neither contemporaneous, nor lithologically identical, sandstone from Derbyshire, as described in Rosenbaum's paper). As we move toward a carbon controlled economy the logic of this exercise will become even more difficult to see.

The North Yorkshire town of Ripon is built of a similarly honey coloured, but much younger, Permian Limestone, formerly known as the Lower Magnesian Limestone, now known as the Cadeby Formation. This was worked from a site known as Quarry Moor, which is now formally established on geological grounds as a SSSI (see http://jncc.defra.gov.uk/pdf/gcrdb/GCRsiteaccount3018.pdf), and is preserved within a local nature reserve. Preservation of this feature – even, you could say especially, on geological grounds has effectively sterilised any remaining building stone that might be present. The quarrying operation has become the equivalent of a zoological specimen in a bottle – pickled in aspic.

It seems that planning systems which impose the need for use of local materials, but make quarrying as a business activity extremely difficult for potential operators are wanting to both have their cake, and to eat it.

We need to understand that geological materials can only be found where they lie. Quarries are fascinating places, and perhaps we should learn to consider them to be as much a part of our heritage and environment, as the bridge which

was built from the stone won in the quarry, or the peregrine that nests high in its hanging wall.

It is unlikely that anyone would wish to see major new quarrying operations in our favourite market towns, but surely there must be a place for small scale artisanal operations, employing a small staff and working a few hundred tonnes a month of high quality locally sourced stone. This must be better than hauling stone from 50 or 100 miles away,

particularly so when the material being hauled is “not quite right” geologically.

It will be interesting to see how the new generation of imported stones blend with the local stone as weathering affects the rock. It may be that they weather to a similar soft golden patina, or they may weather differently, and the imported stones stand out like a sore thumb. I suspect that “truth will out” and planning authorities will in twenty or thirty years be requiring the invading “foreign” rock types to be removed.

In the mean time, if you are wandering the back streets of Ludlow and you spot what you think might be a Carboniferous coral in a wall you know to be built from the local “Silurian” building stone - you may just be correct.

(KHN)

A Walk Over a Precipice

A short distance outside Dolgellau lies the Nannau Estate, nestled between Foel Offrwm and Foel Cynwch. The estate maintain access to an old established walk known as the Precipice Walk – which is an ideal circular walk of only an hour or so, with much of geological interest. Unlike most similar walks in North Wales this one is almost entirely on the flat, contouring around Foel Cynwch from the car park at SH745211.

Probable glacial overflow channel

Spectacular view towards the west from the Precipice Walk, towards the Mawddach Estuary at Barmouth

Bedrock comprises Ordovician intrusives (diorite) intruded into Ffestiniog Flags country rock. The intrusive rocks take the form of large sheet like bodies, and are likely to represent, or at least be associated with, the source of magma erupted and now preserved as the volcanic rocks that form the heart of Snowdonia.

Hand specimen of porphyritic diorite (cubic vugs after pyrite?)

Large quartz boulder used as a foundation stone for a dry stone wall (there's gold in them there walls?)

The walk is a short distance south of the site of the Glasdir Copper Mine, famous for being one of the earliest sites of ore concentration by flotation, and for having been the occasional source of both gold and silver, with these minerals typically associated with quartz veins.

(KHN)

Reports:

NWGA Events

Visit to National Museum of Wales, Cardiff, 17th February 2012.

Is it a bird or is it merely a feathered dinosaur...?

The weather forecast was good so it was in cheerful mood that I set off to meet Keith in the car park outside, where else; Mold Rugby Club, on the morning of Friday 17th February.

Keith is doing his PhD thesis on the areas through which we travelled and it was an interesting experience for a student of geology like me. The junction between the Silurian and the Devonian was very marked, and it was then followed by limestones and Coal Measures of the South Wales Coalfield. This journey across much of the Palaeozoic stratigraphic column made the day out even more special. I found it quite fascinating seeing the changing environments from Ordovician to Silurian to Devonian to Carboniferous, as the tectonic plate moved from south of the tropics, into the desert region and then into the warmer shallower and swampy waters where the trees etc forming the present day coal measures grew, died, fell over, and were buried.

The continuous road works however did slow us down a bit and it was after 1pm when we finally arrived at the museum. Then of course, we had to find somewhere to park, which we did, eventually!

I was invited to accompany Keith behind the scenes, by the curator Cindy Howells. And what an experience that was! While Cindy looked out all of the fossils that Keith needed, I had a discreet look around in some of the other drawers. Amazing;- ammonites the size of footballs and then Cindy showed me other specimens they had, trilobites, not good enough to go on public display but good enough to show me, and permit me to hold them too! - massive ichthyosaur specimens which would have dwarfed human beings…

I casually asked her if she had any dragonfly fossils... Yes, she had!

To then hold a fossil dragonfly that was 150Myr old, and that was exactly the same size and shape as the ones that used to live in/around my pond and come and land on my hand or arm, when I was living down in Dorset was a really intense experience. “What else have you got?” I asked. “Something you will never have seen before”, Cindy replied, producing a tray of absolutely tiny teeth, from the very first mammals. These teeth were less than a millimetre in size, but had the double root allowing a really powerful bite...

By then Keith had joined us and Cindy then showed us back upstairs to the main public area and “Oh blimey!” a fossil of an *Archaeopteryx.*… and also some casts of others!

The characteristic thrown back head evident in most of the specimens is a result of *rigor mortis* she told us. But they were all youngsters too, because the bones were still not fully mature. Even then these creatures had moved away from the solid, heavy, weight bearing, bones like ours; their structure was of a honeycomb form - very strong but yet very light too.

These youngsters died in near perfect (for fossilising) conditions. It is assumed that they were too young to fly properly and had been caught in a monsoonal storm, when hunting insects on the wing. Exhausted they had drowned and sunk onto the lagoon bed and hence into the lime muds - perfect conditions for their preservation. The adults meanwhile escaped the storm – they were either stronger fliers, or simply old enough, and wise enough, not to venture out when offshore winds threatened. When they had eventually died, the normal processes of terrestrial decay and scavenging insects etc successfully recycled everything, leaving no remnants of any adults for us to find.

And then, she showed us a lovely collection of fossils that were on loan from a private collector, and of course the one that really caught my eye was another beautifully preserved dragonfly! With time running out we had a look around the main gallery; the geological ages of Wales, that was worth a visit all to itself!

Cindy offered to host an additional visit in the future and the committee are considering running a further visit but perhaps leaving appreciably earlier than the rather leisurely 9:30AM start we had. There is so much to see, and if a group of us went down in a minibus say, and then split into two groups, one down into the basement first while the other had a look around the public areas, and changing over a lunchtime? We might in this way, be able to do the exhibits in the National Museum justice!

Truly a memorable day out. What a fantastic experience. Thanks Cindy!

Frank Buxton

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NWGA TALKS

Berta Rosen
Kamchatka in 90 minutes.

Our March meeting was given by Berta Rosen, a retired techer of geography, who was instrumental in organising an expedition into the wilderness that is the Kamchatka Peninsula. This large area was closed until the 1990's, and now contains 3 important biosphere reserves. Access remains tightly controlled, especially in the northern part, and Berta was fortunate to gain the support and guidance of one of the wilderness rangers (whose stainless steel teeth made a big impression) for an expedition into the area lasting three weeks. The summer is short, and mosquito-ridden, while many metres of snow grip the area in winter and permafrost is prevalent.

Geologically the area is complex, with oblique subduction in the Kurile and Aleutian Trenches, which reach 7-10Km in depth. The Emperor seamount chain also run into the area while the Sea of Okhotsk sits on its own microplate with tectonic shorelines. The geological history is remarkably consistent with the present situation, and comprises a set of island arcs which have failed to subduct and accreted onto the Asian margin. From West to East the structure comprises the earliest volcanic rocks dating to around 50 Ma, a fault-bound central depression and a second accretionary arc dating to 26 Ma. Finally, newer, recent volcanoes are close to the eastern seaboard, of which 29 are still considered active including Kluchevskoy, which is the largest volcano in Asia. The area has been subject to Alpine-type glaciation and has wonderful, rugged features.

Much of the lower ground is thickly wooded, with Birch and Willow prevalent, while Taiga and Tundra are found higher on the volcanic slopes. Wildlife is abundant, and Berta told us how she was amazed at having to push through shoals of salmon in the rivers which they forded, and occasionally alarmed by finding how closely bears had passed by. Quite apart from the volcanic hazards in the area, earthquake activity leads to frequent tsunami and we were treated to the sight of a long-abandoned fishing boat cast a long way inland and uphill by a historical event. As Berta's travels unfolded we were treated to a wonderful overview of the Kronotsky Reserve, the peaks of Karymsky (which kept everybody awake with effusions every 20 minutes), Maly Semiachik with its brilliant crater-lake and finally the Uzon Caldera.

The Uzon Caldera was formed by a huge rhyolite eruption at about 40Ka, during an interglacial period. Now at around 2000' altitude, this 1700 square km depression is an important microenvironment used by migratory animals to avoid fleeing further to escape the winter cold. Some areas are verdant forest, but it is most famous for its mud pools, geysers and sinter features created by the emergence of hot mineral-rich waters. Bedrock interest includes ignimbrites, tuffs and obsidian, of which some samples were displayed.

Berta's visit in 2003 pre-dated the great mudslide which buried much of the

famous valley of geysers, but it seems likely that in time activity will resume once groundwater conditions have stabilised.

We were also treated to a fascinating insight to extremophiles - algae and bacteria able to thrive in temperatures and acidity that defeat any competition. Finally, photography of the glaciated stratovolcanoes from the helicopter on the way home gave a wonderful perspective view of the landscape seen previously from the ground. This was a

most enjoyable and inspiring talk and we thank Berta for her dedication to her task and the engaging delivery.

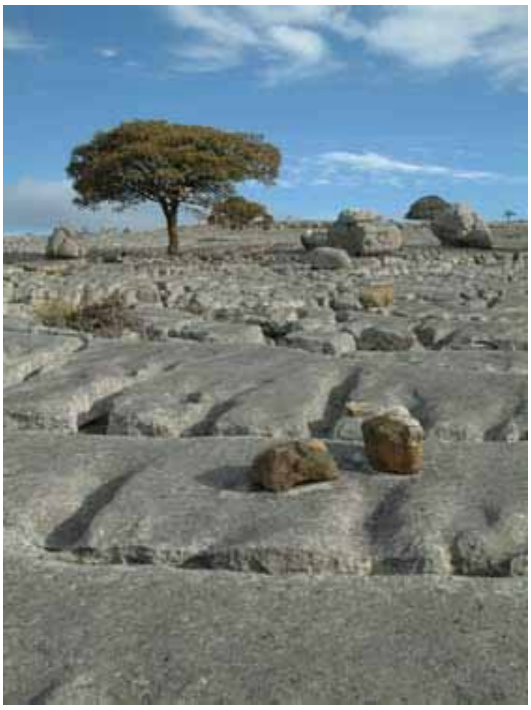
(JW)

Cynthia Burek and Susan Willis
The first holistic classification of limestone pavements.

'Clint Eastwood is known to be an upstanding citizen.' This easily remembered detail removes any confusion over whether the it's the upstanding limestone pillars which are the 'clints' and that it's the gaps in between that are 'grikes'. Settling this fact and having reminded us of the basic process of the formation of limestone pavement through glacial and vegetative processes, Professor Cynthia Burek was able to develop ideas behind a holistic classification of limestone pavement to inform the management of this feature to protect geodiversity and biodiversity.

Much of the work to develop a holistic classification system was undertaken by Prof. Burek's student Dr Susan Willis. Willis's PhD thesis formed the basis of the talk. Unfortunately, Dr Willis is now living in the Dutch Antilles, and was not therefore able to give the talk in person.

Prof. Burek has been fortunate to live close to outcrops of Limestone Pavement in upstate New York, and in North Wales. In her roles with NEWRIGS; through her academic research and connections with the Countryside Council for Wales, Cynthia has been at the forefront of work in this field.

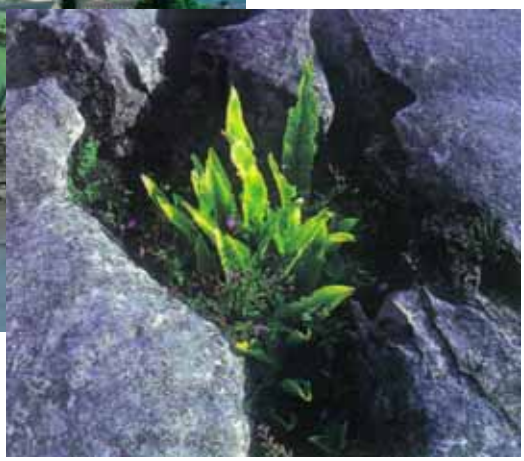


Limestone Pavement is special. It is a distinctive feature in the landscape and provides unique habitats for flora and fauna. The stone has been used since prehistory in field boundary walls, buildings and as a decorative feature in gardens. Many areas have been broken up and the pavement features degraded. Deforestation, cultivation and grazing have impacted on flora and fauna.

Limestone Pavement is the only terrestrial habitat protected by law. A study undertaken in 1976 (Ward and Evans) estimated that 50% had been damaged by the activities of man In England, Limestone Pavement (LP) can be protected by Limestone Pavement Protection Orders (akin to Tree Preservation Orders) and in Wales are protected by the RIGS system. There is now an obligation under European law for LP to be protected.

The requirement for the protection and management of sites has led to funding of research into LP. Britain has 21 000 ha of LP and together, Britain and Ireland have the largest areas of LP in the world. Ireland is applying for the largest example, The Burren, to have World Heritage Site status. Willis' work on a holistic classification system was commissioned by the Yorkshire Dales National Park body, where sites such as those at Malham, with heavy tourist traffic, need a clear rationale for management practice.

Understanding and defining LP as both a geological and ecological entity has taken time to develop. Cynthia took time to explain that a holistic view is essential to developing the necessary management plans to protect LP.



Willis defined LP as: "A partially or wholly exposed area of limestone, fissured by natural erosion into a pattern of clints and grikes, with a distinctive and unique plant community which characterises the microclimates of the grikes".

Willis painstakingly gathered data across a range of 75 geo- and bio- diversity variables from 46 sites in North West England and Wales. Sites show great variability in geological, biological and human influence. Creating a one size fits

all management plan would not be possible. Considering what aspects at a site need to be preserved is key.

The result was a summary classification of 8 types of LP. Lithography, altitude, proximity to structural fault and grazing intensity affected the biodiversity. It was interesting to see the variety especially the wooded mossy lowland sites, very different from the typically bare sites as on The Burren.

Professor Burek spoke passionately about the need to protect these sites. In North Wales we are blessed with a number of varied examples and many at the lecture will be enthused enough to go and take another look. However, beware the slender of ankle, as Cynthia warns that misplaced feet down grikes can cause injury. She asks 'Why not do your bit to collect some of the litter inevitably found down grikes' and…if you find Cynthia's compass…can she have it back please!.

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Many dissertations undergrad and MSc held at University of Chester

(JJ)

Liverpool Geological Society

Joe Crossley
Brachiopod Practical session

"For the next 45 minutes or so I would like you all to pretend that you are a brachiopod!" was the way Joe Crossley introduced this fascinating lecture (term used loosely). Groups of four or five keen "students" sat at a bench with a selection of brachiopods and a tray of sand.

We were then invited to consider what we would like to eat (and how we might

do it), how we might respond to muddy, sandy or rocky substrates, and yes how we might want to go about reproducing.

Some of the specimens were instantly recognisable, *Leptaena*, *Pentamerus* etc tripped off the tongue for most with some formal training. But this was not a pub quiz type "name the fossil" event. Discussion focussed on why valves were in some cases concavo-convex? What was the advantage of a particularly straight hinge line? Why the heavy ribbing?

All left the evening having learnt something (and for those like me who haven't studied macro-palaeontology properly for twenty years or more, remembered much more).

(KHN)

Dates for your Diary:

NWGA
Summer Field Meetings

Sunday, 17th June, Hirnant Valley

Leader Keith Nicholls
Car Parking is limited so the attendance will be limited to 18. Please make sure that if possible cars are shared. Call or e-mail Keith to confirm your place (Contact details at rear of newsletter).

Itinerary
Meet 10AM at Forestry Commission Car Park at Aberhirnant SH 957 326. Decant into a smaller number of cars and drive to roadside parking at Cwm yr Aethnen SH 952 299.

First stop will be the roadside quarry alongside the Vrwnwy Road. After a brief scene setting discussion here we will (courtesy of Mr Lewis of Maesafallen) visit the SSSI at Chwarel Cwm Hirnant (the citation is available for unrestricted download at the CCW website: http://www.ccw.gov.uk/landscape--wildlife/protecting-our-landscape/special-landscapes--sites/protected-landscapes-and-sites/sssis/sssi-sites/chwarel-cwm-hirnant.aspx)

We will then view some Recent / Holocene fluvial geomorphology in the floor of Cwm Hirnant before embarking on a circular walk around Foel y ddinas (reasonably level) walking up stratigraphy through the barren Late Ordovician strata of the Foel y Ddinas Mudstone (actually predominantly siltstone). Hunt for the Hirnantia fauna and or graptolites in Bwlch yr Hwch and walk further up section into the Llandovery. Return to Cwm yr Aethnen, depart for home.

Packed lunch required (nearest shop is 5 miles away in Bala), appropriate footwear, clothing, sunblock, insect repellent etc as weather dictates.

Sunday 30th June
Late Carboniferous Sediments of Malltraeth

Leader Barry Wrightson, who has studied this area in depth. Refer to the article in Newletter Issue 65 October 2011 (The Mermaid's Smile).

Directions and joining instructions will be supplied on registration.

CONTACT:-
Cathy O'Brien (Contact details at rear of newsletter)

Itinerary
Chance to see / study exposures of Carboniferous sediments, comprising gritstone, limestone, and mudstone. The sediments display fluvial/tidal bedding, with herringbone, convoluted and channel bedding; faulting; algal reef; modern erosional quirks; glacial cryoturbation / nodule deposition / leaching /caves; basal conglomerate in a possible carboniferous storm bar, lime sands; mud and iron nodule / sheet deposition. There is also a Precambrian outlier mantled with scree and aqueous deposits, of Devonian desert facies, and a basalt erratic or dyke?

The mud, weed and wet conditions combine to make the going slippery underfoot, and although it will be low tide, the tide can rise rapidly, though with more inconvenience than risk. Good boots or wellies are the suggested footwear

The cliff is weathered and high enough in places to present a hazard from falling stones. There are a few tins, bottles and sundry debris to be avoided, the flotsam of any modern shore. This walk is within the boundary of the Newborough National Nature Reserve, and the rules posted at the start of the walk should be followed. Bring a packed lunch.
10:30AM to 16:00PM Approx

Other Groups Meetings

Powysland Museum / Mid Wales Geology Club
Welshpool Geological Heritage Project Exhibition Until 26th May
(see article this newsletter)
23rd May,
Evening Lecture 'Life in Wales an amazing procession in the fossil record'.
Dr Caroline Buttler (head of palaeontology at NMW)
27th May
Guided Walk around Welshpool – Meet 2:30 PM until 4:00PM at Canal Wharf.
Further details are available from the Mid Wales Geology Club website at www.midwalesgeology.org.uk

Liverpool Geological Society
Sat/Sun 28th/29th Apr
Field Weekend to be arranged.
Sun 13th May
Ribblesdale with Mike Collins.
Sat 9th Jun
Shropshire, Wrekin and Wenlock Edge with Graham Sherwood.
- further details from the LGS web site at:
http://liverpoolgeologicalsociety.org.uk/index.php

Geological Society of London
North West Regional Group
19th April 6:30PM
University of Manchester.
Professor Martin Culshaw
Geohazards in the UK
http://www.geolsoc.org.uk/gsl/groups/regional/nwrg/page10945.html
24th May 6:00 for 6:30PM
Birchwood Park, Warrington
Ed Hough (BGS)

Shale gas in the UK – What, where, why, how?
http://www.geolsoc.org.uk/gsl/groups/regional/nwrg/page10946.html

Mineralogical Society
19th and 20th April
University of Manchester
Geomicrobiology and its significance for biosphere processes
http://www.minersoc.org/pages/meetings/EMG-SGM/EMG-SGM.html

EIG Conferences
5th – 7th September
Edge Hill University, Lancashire
Extractive Industry Geology 2012
http://www.geolsoc.org.uk/webdav/site/GSL/shared/pdfs/events/EIG%202012%202nd%20Circular.pdf

Shropshire Geological Society
Autumn 2012, exact date tbc: The Future of the Universe (guest speaker: Lord Rees of Ludlow, Astronomer Royal and President of the Royal Society) - to be held in the Ludlow Assembly Rooms, organised by the St Laurence's Conservation Trust
- further details from the SGS web site at:
http://www.shropshiregeology.org.uk/SGS/SGSEvents.htm

GeoMon

Thursday 3 May
Pwllfanogl to Menai Suspension Bridge
Meet at 9.30am at Coed Cyrnol
Monday 7 May
Llanddwyn Island
Meet at 1.15pm for 1.30pm start. Start from Newborough Beach Car Park
Saturday 12 May
Lligwy to Moelfre. Geology and ship wrecks.
Meet at 9.45am for 10.00am start. Linear walk starting from Southern car park at Lligwy Bay
Sunday 13 May
Cemaes Bay to Llanbadrig Church,

Meet at 2.00pm
9-17 June 2012
GEOPARK WEEK with Anglesey Walking Festival (See Mentermon brochure:
www.angleseywalkingfestival.com and www.geomon.co.uk for details
Saturday 19 May
Breakwater Park – walk for people with limited mobility.
Meet at 1.15pm for 1.30pm start from Visitor Centre in the Car park.
Sunday 20 May
Bodafon Mountain/Lligwy Bay/Iron Age Village
Meet 11.00am at Bodafon Mountain Car
Monday 4 June
Llanddwyn Island
Meet at 12.15am for 12.30pm start. Start from Newborough Beach Car Park
Saturday 9 June
Lligwy to Moelfre.
Meet at 9.45am for 10.00am start. Linear walk starting from Southern car park at Lligwy Bay (SH 497871)
Wednesday 13 June
Malltraeth –
Meet 10.45am for 11.00am start by Geomon Information plinth near Car park (SH406 687)
Sunday 17 June
Rhoscolyn Walk
Start at 10.00am - meet at Rhoscolyn Church

Saturday 23 June
Penmon Geology and History.
Start at 10.00am in Penmon Priory Car park
Saturday 7 July
Newborough Forest and Llanddwyn.
Meet at 2.15pm for 2.30pm start. Start from Newborough Beach Car Park
Saturday 14 July
Llanddwyn Island
Meet at 9.15am for 9.30am start. Start from Newborough Beach Car Park
Sunday 15 July
Cemaes Bay to Llanbadrig Church.
The meeting place is Cemaes Promenade at 9.45am for 10.00am start and parking is available.
Wednesday 18 July
Cemaes Bay to Llanbadrig Church.
The meeting place is Cemaes Promenade at 9.45am for 10.00am start
Thursday 19 July
Pwllfanogl to Menai Suspension Bridge
Meet at 9.30am at Coed Cyrnol carpark. Walk will start at 10.15am approx.
Sunday 22 July
Lleiniog Beach and Norman Castle.
Meet at 10.00am at Lleiniog Car Park
Saturday 28 July
Rhosneigr to Porth Nobia.
Meet at 10.45am for 11.00am start at beach at bottom of Beach
Saturday 4 August
Llanddwyn Island.
Meet at 2.15pm for 2.30pm start. Start from Newborough Beach Car Park
Saturday 18 August
Llanddwyn Island
Meet at 12.45pm for 1.00pm start. Start from Newborough Beach Car Park
Sunday 19 August
Rhoscolyn
Start at 10.00am - meet at Rhoscolyn Church SH268 757.
Saturday 25 August
Beaumaris Town Walk
Meet at 10.30am in Beaumaris Town Square outside Court Room
Monday 17 September
Llanddwyn Island
Meet at 12.45am for 1.00pm start. Start from Newborough Beach Car Park
Sunday 14 October
Holyhead Mountain Geo Walk –
Start at 10.00am Meet at RSPB Car Park on the Range
Wednesday 17 October
Llanddwyn Island
Meet at 12.45am for 1.00pm start. Start from Newborough Beach Car Park
Wednesday 14 November
Llanddwyn Island
Meet at 11.45am for 12.00pm start. Start from Newborough Beach Car Park
Wednesday 12 December
Llanddwyn
Meet at 10.15am for 10.30am start. Start from Newborough Beach Car Park

Please note that some of the GeoMon meetings carry a small fee, others require payment of a car park charge. Some of the walks are lengthy, and in some cases traverse difficult terrain. Further details are available in a downloadable pdf file at:
http://www.geomon.co.uk/

Geomon's web e-contact details are available at:
http://www.geomon.co.uk/#/contact/4533286691

Alternatively you can write to The Old Watch House, Porth Amlwch, Angelsey or telephone 01248 810287.

Web News:

The Shropshire Geological Society have a web page with links to a wide range of sites, many of which will be of interest to our membership. Please have a look at:
http://www.shropshiregeology.org.uk/sgspublications/links.htm

A reminder that the Geological Society of London store all the Shell University and standard lecture series on their web site. An example of an excellent talk can be accessed at:
http://www.facebook.com/l.php?u=http%3A%2F%2Fwww.geolsoc.org.uk%2Fgsl%2Flandscapehazards&h=yAQGwTdR_AQHzAQb8IpkekGIgklOEIZ_HZvIyqkGZlmUbEQ

The second digital only edition of Earth Heritage published by English Nature / CCW has recently come out and can be downloaded at:
http://www.earthheritage.org.uk/ehpdf/eh37-2012.pdf

Our Facebook and Linked-in pages are slowly attracting a select band of followers. Please take a little time to visit and "link" or "join" as appropriate at:
http://www.facebook.com/groups/northwalesga/
and
http://www.linkedin.com/groups?gid=3031675&trk=myg_ugrp_ovr

At the moment these are being updated regularly and provide useful links to a wide range of materials. We do however need to see more activity to continue to keep the sites fresh and updated.

Finally a reminder of the NWGA Web site itself at: www.ampyx.org.uk/cdgc

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