Geologists' Association - South Wales Group

Cymdeithas y Daearegwyr - Grŵp De Cymru

Newsletter June 2026 ***Sixty Eighth session***

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Welcome to the Summer Newsletter. In this edition you will find the details of the Summer Field Meeting Programme and field meeting reports of those excursions that have already taken place, updates from SEWRIGS, a report on the Geodiversity Day held at the National Museum, Cardiff, Holiday Geo-snaps, plus a number of other items. As usual I thank all those who have provided articles and issue a plea for more volunteers to come forward.

I am hoping to get the next Newsletter distributed in mid-September, so would be grateful to receive items at any time up to 1st September for inclusion in that edition. Please submit any text as a Word file and any images separately as jpeg files. Please don't send a ready formatted article with inset images as these are very difficult to drop into the Newsletter format. In the meantime, I hope that you find something of interest and on behalf of the Committee wish you all a very good summer.

Stephen Howe

Message from the President

Greetings from your new President. Most of you already know me well, as I've been Membership Secretary for a number of years, but I've handed that role onto Geraint Owen and now have the joys of steering this group onwards and upwards for the next two years!

As you may have gathered I'm somewhat passionate about us improving the future for geological sciences across Wales, and especially public awareness of geology. Every time I get to talk to the public about our science, I get feedback that they didn't realise how wonderful, or interesting, geology can be. Hopefully, the success of our recent Open Day in the museum (report in this newsletter) will lead to other such events around Wales, and maybe even some sort of group or forum where we can all link together with ideas, suggestions, offers for help or talks etc.

To get back to our group though, I am supported by a wonderful committee, but we are still struggling when it comes to planning events, field trips, talks etc. Please do have a think about whether you could give up a little of your time to come onto committee and take over a small part of the programme

planning. We don't mind if the role was split so that several people took charge of different aspects, talks, field trips etc.

Maybe you could be the one who contacts potential speakers and keeps in touch with them, and coordinates bookings with our venue in Swansea. Quite often the committee come up with ideas of speakers, but we need someone to coordinate it all after that. The same goes for someone who could organise the details of fieldtrips and leaders and maybe keep track of where we have been recently and see if there are any gaps. We don't expect the Programme Secretary to do absolutely everything!

If we don't get help with this, I can see that there may be an eventual reduction in the number of events we are able to hold. Maybe this will inspire you to join us? We have around four committee meetings a year, some in person, and some on Teams.

Do come and talk to me if you have any brilliant ideas or there is anything else you'd like to say.

Cindy Howells

Summer Field Meeting Programme 2026

Saturday July 18th: ***Sawdde and Carn Powell, Carmarthenshire***: Leaders: *Rob Hillier & Dick Waters*

Meet at 09.30am on the common land 0.7km south of Llangadog (SN 706 276). Car parking at Carn Powell and in the Sawdde Gorge is restricted, so we will need to car share onwards from Llangadog. The first section we will visit is Carn Powell 8 km to the SW (SN 684 221). Access to the hilltop exposure is along the Beacons Way track for c. 500m- boots and wet weather clothing will be required. The trip will then drive to a number of sites in the Sawdde Gorge approx 9 km to the east from Carn Powell. Wellington boots will be required for this section. A packed lunch will be needed as unfortunately there are no options available for refreshments during the day. Return to Llangynog approx 4.30 pm.

We will examine the late Silurian (Ludlow age) delta systems that bordered the southern margin of the Lower Palaeozoic Welsh Basin, in what is known as the Myddfai Steep Belt. The 30 km SW-NE outcrop lies oblique to the NNE delta progradation direction. Delta slope deposits are overlain by delta platform deposits and then by shoreline delta lithofacies. We will examine the complex facies and environments as the basin margin evolved in the SW Tract at Carn Powell, and in the NE tract in the Sawdde Gorge.

Saturday 15th August: ***Penarth Family Day***. Leaders: *John Nudds & Cindy Howells.* (1pm-4pm)

Meet at our gazebo, which will be on the beach just south of the RNLI slipway. We will be setting up from about 12.15pm. Anybody interested in helping out, if only for a short time, please contact Cindy (Cindy.Howells@museumwales.ac.uk). Please note that there is two-hour maximum car parking on Cliff Hill and the esplanade but you can park all day in the Cliff Top car park. However, charging for car parking may affect both areas so it would be advisable to check before setting out.

September (date tbc): ***Cwm Dyer, Clydach Gorge***. Leader. *Alan Bowring.*

Winter Programme 2026/2027

Work has already started on planning the winter lecture series and, hopefully, the programme will be available in time for the next Newsletter. If you have any suggestions for speakers or topics [lease let someone on the committee know.

Field Meeting Reports

Wiseman's Bridge, Pembrokeshire: Saturday 18th May 2026

Leaders: Huw Williams and Paul Davies

Both of the trip leaders have been active in the past within major earth science companies dealing with similar rocks to those we were to study. Their work was focused on understanding the mechanisms on the controls in coal bearing sedimentary basins and, importantly, analogous subsurface basins.

The group of 17 members met at the sea wall at Wiseman's Bridge, where Huw gave a short explanation of the day ahead before we descended the steps and began to walk north-eastwards towards Amroth. The lithologies present in the substantial cliffs along this piece of the coast are all of Pennsylvanian (Westphalian) age and show heterolithic sandstone sequences, with coal horizons, and shaley marine bands with goniatites and some bivalve rich mudstones.

During the Carboniferous, these rocks were deposited during the palaeogeographical changes that accompanied the Hercynian/Variscan Orogeny, when an oblique (dextral) collision of the Gondwanan African Plate with the European Laurasia plate occurred that would eventually form Pangaea. This collision created a Himalayan-scale mountain belt as well as actively affecting the tectonic and stratigraphic evolution of the resulting foreland basin, now seen as the Pembrokeshire/South Wales Coalfield. The Pembrokeshire Coalfield shows evidence for considerable deformation and the section we studied shows several fault/thrust duplexes that repeated the section and thickens and repeats the coal seams. This degree of deformation increases westwards and, in addition to the often intense, folding and faulting (Fig 1), caused anthracisation of the coal seams, which are often highly sheared. This often leads to the coal being very friable and breaking up into very small pieces, known as Culm. It is thought that this Variscan deformation may have led to a 60% shortening in Pembrokeshire.

Fig 1. Symmetrical anticline with faulted, thickened, vertical coal seam behind © Chris Lee

The sequence we studied comprised a series of sandstone/shale/coal seams arranged in a succession of repetitive cycles (parasequences), or cyclothems in old money. We saw several cycles, the sandstones showing erosive bases with impressive channel lag deposits and often spectacular cross-cutting relationships. Within the overall coarsening-upward sequences we saw 'fining up' channel beds with good examples of climbing ripples, with wave, flaser and lenticular bedforms. Rapid deposition was indicated by water escape structures and 'dish and pillar' features. Within the 2-15m stacked, coarsening-up sequences the cycles often contain dark grey, laminated shales containing siderite (iron carbonate) nodules and thin beds. These nodules form in sulphate poor (ie fresh water), low oxygen conditions (caused by the oxidation of the abundant vegetation) diagenetically within the sediment. These nodules, often known as clay ironstones, were worked historically before the coal seams, by family groups. They 'scoured' the cliff face by creating landslides to expose and excavate the ironstone, often on the beach, many of which are still evident today.

Fig 2 (Left). Exposed coal seam (probably the Garland) with well-developed Sigillaria *in the seat earth below. © Chris Lee*

We were also able to study several coal seams eg the Timber Vein, so called after the amount of timber that was needed to shore up its fractured roof. These often exhibit *Stigmaria*-rich, extensively root penetrated seat earths (palaeosols). We saw good cross-sectional examples of *Calamites* trunks in life position, and also possible lycopod trunks (Fig 3).

The Marine Bands (eg the Amman Marine Band) and bivalve bearing shales were somewhat difficult to see owing to the nature of the rock, but were pointed out by Huw and Paul who explained how, subsequent to the marine transgression, there was a prolonged accumulation of sediments in a coastal plain environment that contained coal swamps, fresh/brackish water lakes, tidal flats and channel complexes. It was noted that the coal seams close to the marine bands were often very rich in sulphur (iron pyrites). This sulphurous coal (eg the Golden Coal of Tenby), was originally thought to be very desirable for the malting of barley as the sulphur dioxide, produced from the coal as it roasted the grain, bleached the barley and gave the beer an attractive golden colour. However, as the pyrites was in fact arsenopyrites it was removed from beer manufacture owing to many arsenic related poisonings. Only low sulphur coals can be used in the brewing process today.

Fig 3 (right). Cross- section of lycopod in life position © Chris Lee

Following lunch, back at Wiseman's Bridge, we travelled south westwards to Coppet Hall Beach where we saw a broad, flat, southerly plunging anticline/syncline pair. The lowest sediments comprise a series of coarsening-up lacustrine delta deposits above the Catshole Coal Group. Here we again saw *in situ Stigmaria* and also ball and pillow soft sediment deformation. Overlying these units is an extensively rooted siltstone facies, showing a series of *in situ* arborescent lycopod tree trunks up to 85cms in diameter (*Fig 3, left ©Chris Lee*). Unfortunately, it was at this locality that we encountered an individual smashing *Stigmaria* roots from the bedding plains. When confronted by the group he

ungraciously left the scene complaining that as they were over 4000 years old (obviously a follower of Bishop Usher), what did it matter. Incorrect at so many levels! Clearly, with the local preservation of both *Calamites* and tree lycopods *in situ* (as well as the more recent submerged forest), this beach should be considered of high palaeobotanical significance. Similar ex *in-situ* tree trunks over I50 cms tall can also be seen in Saundersfoot Harbour where they are used as bollards to tie up boats. Not to be missed.

The final part of the day was spent examining a very confusing 15m. thick composite sandstone body containing a series of vertically stacked, fining-upward beds, interpreted as channel deposits, with spectacularly exposed (if complex), channel bank collapse features.

Fig 4 (Left). Typical sandstone dominated sequence © Chris Lee

On our walk back through the old coal/ironstone railway tunnels, passing old adits in the cliffs, Paul and Huw explained some of their 3D modelling work which placed the day in a facies model context. On our final stroll, along the promenade, we looked gingerly up at the bulging stell netting that was gallantly trying to keep the falling debris away from the tourists.

Thanks Huw and Paul. A great trip.

Chris Lee

Middle Hope, Western-super-Mare, Saturday16th May 2026

Leaders: Susan B. Marriott and V. Paul Wright.

The purpose of this excursion was to examine the Carboniferous Black Rock Limestone subgroup that contains the lavas and tuffs of the Middle Hope Volcanic Member (MHVM). Owing to the unstable nature of the cliffs we were unable to examine the Quaternary peri-glacial slope and aeolian deposits of the area.

Twelve of us met at the National Trust carpark, where we were given a quick introduction to the day, before climbing up to the trig. point above the beach where we had panoramic views of Steep Holm, Flatholm and the south Wales coastline to the north and the Somerset Levels, the Vale of Gordano and Kenn to the north east. Susan explained the general Quaternary background and how the Vale of Gordano had been influenced by possibly both the Elster and Wolstonian glaciations.

The outcrop at Middle Hope is a west-east aligned headland, north of Weston-super-Mare. The predominant rock type is the Black Rock Limestone (BRL), interbedded with tuffs and lavas of the Middle Hope Volcanic Member (MHVM). Such interbedded volcanic rocks of Carboniferous age are rare in Britain. At the top of the BRL a palaeosol/karst above which is a thin outcrop of the Gully Oolite. This horizon represents a very large, rapid, sea-level fall that was related to the build-up of ice on Gondwana, to the south. During the early Carboniferous the British Isles were situated a few degrees south of the equator and the Bristol area was on the southern shore of the Anglo-Brabant Massif. The BRL was deposited on a southerly sloping marine shelf (an outer carbonate ramp), in low energy waters below storm wave base. The volcanic activity was relatively short lived, but may have resulted in a temporary thermal doming of the seafloor, causing shallowing that may have changed conditions from outer ramp to shore-face conditions.

Descending to the beach we examined the outcrop at Swallow Cliff, traversing a low, undulating cliff line cut into the limestones and tuffs. The top of the cliff here is an undulatory fossil shore platform that slopes south to north from 12.5m OD (approx. 5m above beach level) to 7.5m OD (approx. beach level) of indeterminate age. Here, ten Quaternary sedimentary beds rest on this platform but they proved very difficult to examine due to the nature of the cliff faces.

At Swallow Cliff beach we examined outcrops of the BRL here of early Ivorian Age. The rocks are well bedded, dark grey, lime wackestones with abundant chert reflecting their deep-water outer ramp environment. At the top of the sequence Dilys noticed a poorly preserved Siphonophylla type coral that promoted an interesting discussion on whether some corals at this time could live in relatively deep water, possibly without their algal additions. Macro-fossil evidence was otherwise poor and we heard that the sequence is generally correlated by conodonts.

Directly overlying the limestones are largely pyroclastic, brown, green and red tuffaceous beds with abundant lapilli. These are graded or ungraded in coarse and fine layers showing local cross beds and are interbedded with fossiliferous limestones. The tuffs themselves commonly contain marine fossils and show gradation from calcareous tuffs and nodular tuffaceous limestones into 'clean' limestones. An interesting feature seen here is the extensive calcite 'net veining' (Fig 1), that develops in some beds. An extensively weathered amygdaloidal, porphyritic, interbedded basalt was seen that has been interpreted as similar to a peperite. As the relationships of the beds in the outcrop is often very difficult to understand, several interpretations are possible. The outcrop certainly shows pillow lavas breaking up within carbonate sediments, but whether they are entirely intrusive into wet sediment or extrusive sea floor pillow lavas that invaded wet sediments is poorly understood. Most of the peperite is pillow-fragmented jointed blocks and spalled glassy crusts intermingled with carbonates (I Skilling pers. comm.).

***Fig 1**. Pillow lavas/peperite in Black Rock Limestone, Swallow Cliff Bay. © Lesley Cherns*

This igneous sequence thins to the east, which indicates that the volcanic activity lay somewhere to the west of Swallow Cliff. Its lack of appearance in contiguous co-eval limestone successions is possibly due to the prevailing wind direction during this time.

In the cliff face above the BRL and MHVM outcrop, a well-defined surface was seen owing to a recent cliff fall. Here, in the coarse lag at the base of the succeeding cross-bedded lime packstone /grainstone, (designated informally as the Middle Hope Limestone Member), stromatolitic-coated clasts occur that have been incorporated into the lithology as a ravinement-level transgressed back over the exposed(?) surface. This horizon is the lower of the two enigmatic surfaces that exist in the BRL. The upper one, at the junction with the Gully Oolite (see section), implies a very significant sea level fall. It was also suggested that an, as yet unconfirmed, exposure surface may exist in the BRL below the volcanics!

Moving north-eastwards along the coast, we again saw the poorly exposed volcanics but were able to examine the spectacular bioturbated carbonate, known locally as ‘pipe rock’. This shows a well laminated carbonate, punctuated by abundant vertical burrows (pipes), thought to represent the pedicle traces of the brachiopod Lingula sp. (Fig 2). There were also several U-shaped burrows showing ‘spreiten’ laminations. At the top of the bed, larger burrows of a branching Thalassinoides type were seen. This Skolithos-type ichthno-facies would suggest a relatively shallow water environment, further reinforcing the idea of a regression at this time in the BRL.

*Fig.2. Tuffs with ?*Lingula *burrows and pipes, Middle Hope Bay. © Lesley Cherns*

At our lunch time exposure, a little to the northeast, we again examined the inferred Middle Hope Limestone Member, showing its grainy nature with wave and current cross beds.

At our final exposures, along the cliffs at the northern end of Sand Bay, we examined the hummocky top of the BRL exposed below the Gully Oolite. This surface is similar to the palaeokarstic surfaces found widely in early Carboniferous shallow water limestone successions, and have been interpreted as representing vegetated karst land surfaces formed during sea level falls. An impressive clast filled Quaternary solution pipe that terminated at the horizon was also seen (Fig 3).

Fig 3 *(left) Pitted palaeokarst surface in the BRL, overlain by coarse bioclastic limestones and the Gully Oolite. Middle Hope. © Lesley Cherns*

The exposures seen on the trip gave the group an insight into the volcanics interbedded with the BRL outer ramp deposits and an intriguing idea of major sea level falls and rises, during the early Carboniferous. These were caused by glacio-eustatic sea level oscillations which could range from 20m to 150m. In conclusion, Paul explained how changes in oxygen isotope values suggest significant ice sheet build ups and melt outs in Carboniferous times. These were closely linked to global changes in carbon isotope values, suggesting natural sequestration of enormous amounts of carbon, that were stored in the oceans (reverse greenhouse effect). The well documented absence of late Tournaisian rocks, north of Western-super-Mare, might also relate to these global sea level changes and in part to local tectonics. Therefore, Paul and Susan’s trip gave us an understanding of how local geological features may explain global geological phenomena.

Thank-you both.

Chris Lee

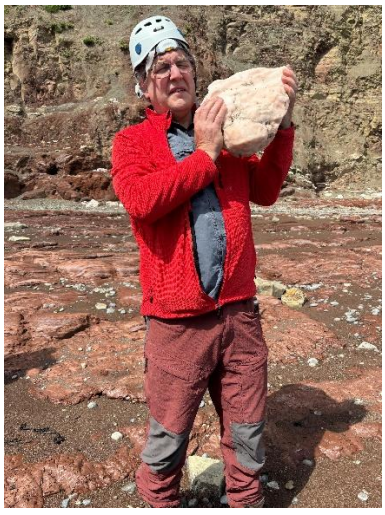
Lavernock. Saturday 13 June 2026

Leaders Chris Berry & Lesley Cherns, Cardiff University

Twenty-three members and guests met at the C12th St Lawrence's church at Lavernock Point. The church is constructed mainly of blocks of Lias stone that were taken directly from the beach below. It was from here in 1897 that Guglielmo Marconi transmitted *Radio Waves* over water to Flatholm island, but it was pointed out that in 1892, Sir William Preece and Arthur Heaviside had done a similar thing, but using the more cumbersome *electromagnetic induction* technology.

The aim of the trip was to examine the lithostratigraphic evidence for a marine transgression that changed the environment from that of an arid desert in the Upper Triassic, through semi-arid and lagoonal conditions to shallow marine in the Lower Jurassic. The dip of the strata, here in the form of a shallow anticline-syncline pair, allowed us to explore the full sequence by walking south along the beach from Ranny Bay. The lowest beds exposed belong to Branscombe Mudstone Fm followed by the overlying Blue Anchor Fm (the uppermost part of the Mercia Mudstone Group). Above lie the Penarth Group consisting of the Westbury Formation, Lilstock Formation consisting of the Cotham and Langport Members) and then the transition to the Jurassic Blue Lias Formation (consisting of Bull Cliff, St. Mary's Well Bay Members). It is at Lavernock where the oldest Jurassic dinosaur (*Dracoraptor hanigani*) was found within the Bull Cliff Member in 2014.

The first stop was at Ranny Bay to look at the alabaster beds where large nodules of white, and more precious pink, gypsum are exposed in red beds belonging to the Branscombe Mudstone Frm (Fig. 1). This Penarth Alabaster was mined from about 1870 as an ornamental stone and in 1905 was used to decorate the staircase in the Cardiff University main building. The sediments were laid down in a shallow, hypersaline desert lake on the edge of a land mass. The lake dried out completely at times, producing sabkha conditions. The fine texture of the alabaster suggests three separate environments of deposition: massive, vertical crystals signify *in situ* crystallization; smaller crystals result from direct evaporation to a thin crust; and the granular (saccharoidal) variety is from reworked sediment on tidal flats. At this point, the group discussed the relative abundance and mode of formation of anhydrous calcium sulfate (anhydrite) versus the hydrous form (gypsum).



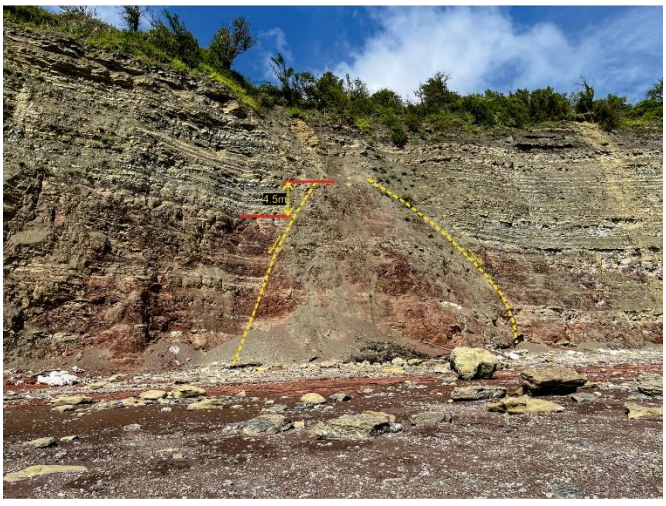


Fig 1 Above left). Arid desert red beds with gypsum. Ranny Bay, Branscombe Mudstone Formation. Chris Berry holds the Penarth Alabaster. © Debbie Privett.

Fig 2 (Above right). Arid red beds (Branscombe Mudstone Formation) below semi-arid (Blue Anchor Formation) at Ranny Bay. Horst structure with 4.5 m throw. © Kevin Privett.

The cliffs here are folded into a broad anticline in the core of which is a small horst formed by a pair of conjugate faults, with throws of about 4.5 m. This is faulting is indicative of crustal extension and it was explained that extension generally leads to the land going down and, hence, sea level rise (Fig. 2).

Progressing south, the red beds of the Branscombe Mudstone Frm, seen at the base of the cliff, are followed by the grey-brown beds of the Blue Anchor Frm, the top unit of the Mercia Mudstone Group, which contain some small gypsum layers and two red-bed layers. The red colour is from oxidized iron and the grey from reduced iron. The sequence here indicates that the environment was getting wetter.

A little farther south the black shales, rich in organic carbon and pyrite, of the Westbury Frm appear. On exposure to air the pyrite oxidizes to produce sulfuric acid, that leads to secondary mineralization on the exposed discontinuity surfaces. Calcite in the sediments reacts with the acid to form selenite (gypsum) and jarosite (a hydrated potassium and iron sulfate) (Fig. 3). The unit smells of sulphur. The formation was deposited in an anoxic environment where organic debris (pollen, plankton, algae, plant matter, etc.) rained down from above on to the sea floor. Several bone beds occur in the lower part of the unit, which contain fractured pieces of bones derived from fish and marine reptiles. These were rolled back and forth on a Triassic beach before being incorporated into the sedimentary sequence. Unfortunately, we did not manage to see any bone bed.

Fig 3 (Above left). Marine black shale (Westbury Formation) with secondary mineralization of selenite (gypsum) and ?Jarosite at Lavernock Point. © Kevin Privett.

Fig 3 (Above right). Marine Lilstock Formation at Lavernock Point (Cotham Member below Langport Member). Evidence of sub-areal exposure within the Cotham Member. © Kevin Privett.

The low cliff at the bottom of the path to the beach at Lavernock Point exposes the Lilstock Frm (comprising the Cotham and Langport Members). These include a sandy layer with mud cracks, which represents the last dry surface before hundreds of metres of Jurassic marine beds were deposited above (Fig. 4).

The base of the Jurassic is problematic in Wales because the Global Stratotype Section and Point, which is in Austria, is placed at the first occurrence of an ammonite species that is missing at Lavernock. *Psiloceras planorbis*, the first ammonite to be found at Lavernock, is actually the second ammonite zone of the Jurassic. Historically, the thick paper shale horizon has been taken as the base of the Jurassic, but recently other dating methods have been employed to obtain a better correlation with the stratotype (such as magnetic susceptibility and carbon isotope ratio). The junction is now considered to be 300 mm above the Paper Shales.

The basal Jurassic beds here are the Bull Cliff Member, which form the lowest part of the Blue Lias Frm, and consists of a sequence of interbedded limestones and mudstone (Fig. 5). Fossils here include *Liostrea*, an oyster, proving marine conditions existed before the appearance of the first ammonites (*Psiloceras planorbis*), *Modiolus*, *Plagiostoma* and rare marine reptiles and a dinosaur.

Fig 5 (Above left). Fully marine conditions at Lavernock Point with the onset of Jurassic strata (300 mm above the Paper Shales). From the base: Langport Member, then Paper Shales, then Bull Cliff Member (rhythmic sediments). The Dual Bed, the base of the St. Mary's Well Formation, is halfway up the silver pipe. Ammonites start at top of the pipe. Dracoraptor & Ichthyosaur have been found here. © Kevin Privett.

Fig 6 (Above right). Marine conditions at St Mary's Well Bay. From the base: Bull Cliff Member, St. Mary's Well Bay Member, Lavernock Shales Member and Porthkerry Member. © Kevin Privett

Turning the corner into St. Mary's Well Bay reveals a long cliff with a broad synclinal structure with the Bull Cliff Member at the base. Above this is the St. Mary's Well Bay Member, its base marked by a distinctive double limestone known as the Dual Bed. Composed of alternating beds of clayey limestone and calcareous mudstone, the St. Mary's Well Bay Member is about 75% limestone. This passes upwards into the Lavernock Shales Member (~75% mudstone) and then into the Porthkerry Member (~75% limestone) (Fig. 6). The rhythmic alternation of mudstone and limestone has been attributed to depositional and/or diagenetic changes. Depositional changes are said to result from sea level and climate changes caused by variations in Earth's orbit. The limestones are considered to represent cold, dry climate and the mudstones warm and wet. On the other hand, early stages of diagenesis of a uniform calcareous mud are said to have created separate limestone and mudstone layers driven by dissolution and precipitation reactions.

Kevin Privett

Geosciences Open Day, National Museum Cardiff, Saturday March 28th 2026

This meeting, attended by 61 delegates who represented all aspects of Welsh geology, was convened in order to bring together geologists from across Wales for the purposes of networking and sharing views on Welsh geodiversity, both now and in the future. After a welcome by Cindy Howells (President of the *South Wales Geologists Association* and Curator at NMW), and an introduction to the other museum curators, attendees were free to wander around the various stalls, while museum curators led eight small groups into the stores for a brief taster of what the museum has to offer.

The morning session allowed attendees to network, put faces to well-known names, as well as gathering knowledge of what organisations and research groups were doing. The following lunch break allowed the chance to visit the museum galleries as well as continue the networking.

Fig 1 (Left). The stalls set out for the morning session © Cindy Howells

The afternoon session consisted of a number of small talks from representatives of many of the groups present. Cindy led the way explaining the thoughts behind the meeting and the state of geology in the museum where her department had been reduced to just three geologists, from a high of over 20 a few decades ago. This is a pattern that seems to be common throughout Wales where no other museums have geological curators, universities are cutting geology courses, and geology in schools is almost extinct. Other public bodies, such as *Natural Resources Wales* (NRW) and the *British Geological Survey* (BGS) are also struggling for funding despite geology underpinning life on Earth. It is very popular with children and their families and she felt we needed to develop ways to support this public interest and attract those children into studying sciences generally. Many geology groups exist, but these are generally dominated by the older generation, so we need to look to increase diversity. Geoscientists in Wales need to pull together and form a better network so that strengths and weaknesses can be identified and addressed.

Lucy McCobb (*NMW*) highlighted the international research that is carried out in the museum, while her colleague, Dan Cox talked about the laboratory facilities within the museum and its important mineral and rock collections. Cindy then read out a statement from former colleague Tom Cotterell who emphasised how the industrial history of Wales is entirely down to its unique geological diversity, and how losing most of the mineralogy/petrology posts in the museum impacted on the ability to attract donations.

Brian Williams (*Old Red Sandstone Research Group*) outlined the vast amount of work they had carried out over the years, including numerous PhD students from 5 different universities.

John Nudds **(***SWGA***)**, spoke on the group's activities and the composition of its 150 membership which includes amateur enthusiasts, academic and industry geologists. He urged all geologists to consider joining their local GA group, or equivalent, in order to benefit from shared experience, and to share their own knowledge. Keith Nicholls (*NWGA*) told how his geological career directly resulted from attending outreach meetings organised by the National Museum in 1971. He praised the various geological books published by the museum, but felt that north Wales was somewhat out on a limb, with several disparate groups (*GeoMon*, *Brymbo* etc) doing their own thing, and *GeoConservation Wales* having folded. He felt that as a community we desperately undersell ourselves and miss out as a consequence. Lynda Garfield spoke on behalf of the geological enthusiast and retired geologists, who make up so much of the membership of local groups, and the importance of the networking this offers. She felt that it is important that we should all be better at selling geology to the wider community.

Tim Astrop (*Brymbo Fossil Forest Project*) explained how almost all of their work was undertaken by volunteers, who developed a sense of ownership and great knowledge of the site. Many younger people were getting involved.

Jo Botting and Lucy Muir **(***Heart of Wales Geopark)*, felt that there is a perception that Welsh geology has been done, and finished with whereas discoveries, such as within this geopark, prove that there is still much more to be discovered and researched, but it needs more recognition. Alan Bowring (*Fforest Fawr UNESCO Geopark)* spoke of the other UNESCO landscapes around Wales, all of which, directly or indirectly, have significant links to geology and are trying to forge better links between themselves. The management group of the *Fforest Fawr Geopark* has representatives of many geological groups and institutions, while a potential extension to the park will include more post-industrial communities.

Nigel McGaw (*South East Wales Regionally Important Geological Sites Group* (*SEWRIGS*) reported that the *SEWRIGS* is the only active RIGS group left in Wales, which is run by a small group of enthusiasts and volunteers, yet carries out really important work in clearing and producing interpretation of geo-conservation sites and Sites of Special Scientific Importance (SSSI's). He stressed the need for an all-Wales geodiversity group, or at the very least, more RIGS groups to look after their local sites**.** Chris Byrne and Tom Hughes both spoke on behalf of *Natural Resources Wales*. Chris' talk outlined the work that *NRW* did to manage geological sites in Wales, while Tom spoke about his geological journey, from geology A-level to his dream job of looking after geological sites in north Wales.

Steve Plant spoke about the *Russell Society* that is devoted to the collection, identification, reporting and conservation of mineral specimens. He emphasised how important mineralogy to Welsh geology and that the NMW houses one of the finest collections of minerals found in Wales, which is a huge educational resource which should be encouraged and supported. Helen Kerbey**,** from the *Mineralogical Society*, felt that networking outside of Wales was probably needed to help with mineralogy education and its promotion within Wales. She explained that the *Mineralogical Society* was hoping to start a new group on 'Society and Museums', which may be able to help to eventually bring more Welsh discoveries to light.

Rhian Kendall, *BGS Chief Geologist for Wales*, outlined the resources that they have at their Welsh office in Cardiff University. They are the prime provider of geoscientific data and a major research centre partially funded through NERC. Their website provides useful datasets, images and map viewers to allow anyone to access information about British geology.

Elizabeth Hampton**,** a geology Masters student from *Cardiff University*, felt that geology needs far more public exposure and awareness, while Diana Contreras, a lecturer in geographic information systems (GIS) from *Cardiff University*, spoke about their ongoing project to increase diversity within the STEM network. Her poster promoted prominent female geologists, such as Mary Anning, Katia Krafft, Marie Tharp and Kathryn Sullivan and also circulated a list of books that could attract children, mainly girls, into geology and other STEM associated subjects. David Buchs, a senior lecturer from *Cardiff University* explained his work on developing a 'student community-led' initiative to promote geoheritage and communication in the Cardiff area, which he hopes will go beyond just academic output, to include a range of audiences.

Susan Glendinning, of *Earth Science Partnership* in Taffs Well, spoke about her company, a consultancy of a engineers, geologists, and applied environmental scientists, and how difficult it is now for them to find geological graduates that have the necessary qualifications as many relevant university courses have been cancelled. Melissa Johansson did the same for her company, *Geode Energy*, who provide geological data analysis for the oil, gas, water and geothermal industries. In order to engage better with the public, she has recently started making YouTube clips of herself and her dog on field excursions in south Wales, that explain local geology at a basic level.

Sarah Williams, representing a local *University of the Third Age* (*U3A*) group, which has an interest in continuing education for older people, was concerned about the reduction in university, A-level and

GCSE courses, and specialist museum curators given that museums are essential hubs for knowledge and research as well as being specimen repositories. Michael Darke explained that he had spent many years working in the geoscience industry and finds it disheartening to see geological teaching and expertise disappearing across the UK. He was concerned about how we preserve essential geological skills for the future. Including geology in broader environmental science degrees does not provide students with clear professional pathways, leaving the discipline's future uncertain

Meeting feedback came from Elen Wharton(*SEWRIGS*) whose perception of the state of geology had been fairly negative before the meeting, but she was impressed by the enthusiasm shared and talked about during the event, the broad range of attendees, and the willingness for more co-operation between various groups while Matthew Myerscough, a local geological collector and writer, was pleased with the format of dividing the day into two components.

Overall, the message of the day was that the geological heritage of Wales is something we should all be fighting to preserve and promote. We urgently need a stronger geosciences community in order to forge and maintain a network across Wales, rather than working in disparate groups. The aim should be to promote the geology and geological heritage of Wales to public communities, with a view to inspiring a sense of pride, and even potential income through geotourism, in a similar fashion to the Scottish Geology Trust.

Meetings such as this one need to be continued across Wales to weld geoscientists into a more integrated community, better able to assist each other with research, facilities, support and outreach.
Cindy Howells

SEWRIGS

The RIGS group held another successful meeting at Llanfoist Village Hall, near Abergavenny, on April 25th 2026 when we discussed the business side of our activities. On a lighter note, after lunch Alan Bowring led a walk around the Canada Tips RIGS site near Blaenafon, which forms part of a Unesco World Heritage Site. We were lucky that it was such a beautiful day and could even see Pen-y-fan in the far distance. The name Canada Tips is derived from the surface mining for coal that occurred between 1941 - 44 by the Canadian Army, which provided the specialist drills and experience needed for this kind of work .It is thought that these are the only workings of this type in Britain that survive in an unrestored condition and one of the earliest examples of open cast mining in Britain. They also give a relatively rare surface opportunity to examine the south Wales Lower and Middle Coal Measures with their coarsening-upwards coal capped units. These cycles are typical of fluvial dominated delta plains; fine-grained mudstones at the base of the sequence, coarsen upwards through silty mudstones and siltstones to fine sandstones. The finer lithologies are frequently rich in carbon while ironstones composed of siderite are common. The fine mudstones are lacustrine in origin, being deposited in deep, freshwater lakes. The sandstones at the top of the cycles are mouth bar deposits of minor channels. Sandstones can also occur at any point in the cycle as distributary channels, crevasse splays and levee deposits. Channel-fill sandstones are the coarsest sediments and can be conglomeratic at their bases before fining upwards and are cut into underlying beds.

During the walk we looked down into the very large historic ironstone quarry, passed through the area where a number of coal seams occur, now largely covered by scree, and looked at a small quarry of thicker sandstone beds containing very impressive large fossil log casts. Many thanks to Alan for highlighting an area of particularly important geology which played such a large part in developing the industrial history of south Wales.
Nigel McGaw

Candleston RIGS

The group managed to fit in a second trip to this interesting quarry. It is on private land and permission was sought and given. On this visit, we concentrated on clearing sections of the face, the wet and rather warm Spring having led to an explosion of vegetation both on the rock faces and at their bases, Himalayan Balsam and Bramble being the two most invasive species. Clearing the faces revealed some of the sedimentary structure of the Brofiscin Oolite, the geometry of the unconformity and the extent of the mineralisation.

Fig 1. The Brofiscin Oolite © Elen Statham

Fig 2. The unconformity © Elen Statham

The Brofiscin Oolite marks a widespread shoaling event within the Black Rock Limestone Subgroup of the Carboniferous Pembroke Limestone Group. Planar and cross lamination testify to its accumulation in shallow, wave agitated waters (Fig 1). The unconformity lies between the Dinantian (Courceyan) age Brofiscin Oolite and the Jurassic Lower Lias marginal facies limestones and conglomeratic limestones, and which represents an impressive 150 million year gap (Fig 2).

Fig. 3. Mineral veining © Elen Statham

The mineral veins (Fig 3) intrude both the Brofiscin Oolite and the Jurassic rocks above. Calcite and barite infill former voids, as well as fissures and joints and, on this occasion, Lynda identified the presence of galena. The present-day voids coinciding with the mineral veins begs the question – was this site worked for lead in addition to quarrying for limestone? - more desktop homework for the team!

One puzzle we have encountered is that the site description and site boundary map do not seem to totally match up with the area that we are clearing and seems to include the much larger quarry just to the northwest that exposes the whole of the Brofiscin Oolite. More work is needed, both on site and in the literature to clear up the anomalies. More volunteers are always welcome!

Elen Statham

Gem Rock Museum closure

Further to Kevin Privett's short note about taking the opportunity to visit the Gem Rock Museum in Creetown in the last Newsletter, we have learnt that the museum will now close at the end of October. It has been part of the visitor landscape of the area since 1981, but the owners had been looking to sell the museum for over five years and, having had no success, have made the hard decision to close at the end of October. However, it is still hoped that someone might come forward to take over the business.

Holiday Geo-snaps

Hunstanton Cliffs. Norfolk

The cliffs at Hunstanton in Norfolk (TF 676420) face west on to The Wash and are protected as an SSSI. The most striking feature is an unusual band of Chalk, that is a deep red colour, and which is only seen here, in Lincolnshire and in Yorkshire. The strata are all Cretaceous in age and of a shallow marine origin (BGS app).

At the base of the cliff is a red-brown layer of cross-bedded, and in places pebbly, sandstone called the Carstone Formation. It is detrital and ranges from coarse to fine-grained (locally with some carbonate content). It contains the iron mineral glauconite, which is greenish brown, but oxidises to a rusty brown.

The middle layer comprises the Hunstanton Chalk Formation, which is about a metre thick. This is biogenic and detrital and mostly composed of coccoliths. The brick-red colour derives from disseminated haematite, but locally the upper part can be grey because of secondary alteration of the iron minerals.

The top layer is the more traditional white Chalk of the West Melbury Marly Chalk Formation and the Zig Zag Chalk Formation (undifferentiated). Again, these are biogenic and detrital and mostly composed of coccoliths.

© Kevin Privett

Natural geomorphological processes are operating unimpaired and are actively generating cliff and beach landforms, including the shore platform. Wave attack is causing cliff erosion, visible in numerous cliff falls, which supply sediment to the coastal transport and deposition system. According to the Natural England citation, upper beach processes are transporting material southwards by long-shore drift while lower shore processes are transporting material northwards by tidal action. It is likely that Hunstanton Cliff SSSI is playing a significant role in the sediment budget that maintains the coastal landforms to the north at Gore Point and Holme-next-the-Sea and to the south at Heacham and Snettisham.

The photograph shows a number of joint sets, many of which are dilating under tensional stress and are ready to fail at a moment's notice.

Kevin Privett

The Norber errratics, North Yorkshire

The Norber erratics are on Norber Brow, on the west side of Crummack Dale, near the village of Austwick, in North Yorkshire (SD764698). Here there are hundreds of large, angular blocks of Silurian-age Austwick Formation sandstone resting on a younger Carboniferous limestone pavement. Their maximum dimension of the blocks is 4 meters and the most spectacular ones stand on pedestals of limestone up to 500 mm above the surrounding ground level.

© Kevin Privett

The interpretation is that they were transported to Norber Brow by the Yorkshire Dales ice sheet as it moved from the north over the area. Dating suggests they have been there for some 12,000 to 17,000 years. The underlying limestone pavement was initially created by glacial scour and since then has been developed by karstic weathering. The pedestals have formed where the underlying limestone has been protected from erosion by rain and frost and has not eroded away like the surrounding ground.

Kevin Privett

- Most of our lectures are recorded and uploaded to our website (www.swga.org.uk) for a few months.
- We also have a YouTube channel as well as maintaining a Facebook presence (https://www.facebook.com/groups/179899022064977). With Facebook, anyone can join in and the more that do, the better it is!
- ***Earth Heritage Magazine*:** This is now only available in an electronic format, which can be found at: http://www.earthheritage.org.uk/wp/wp-content/uploads/EH-53_final.pdf

Contacts for other local geological organisations

- ***Welsh Stone Forum (Fforwm Cerrig Cymru***): Contact: www.museumwales.ac.uk/en/welshstoneforum
- ***Open University Geological Society*** (***Severnside Branch):*** Contact: Andy Mitchell (ougs.org/severnside)
- ***South East Wales RIGS Group***: http://sewrigs.wordpress.com/
- ***West Wales Geology Society:*** www.westwalesgeolsoc.org.uk

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Keeping with the theme of unconformities here is one from Heatherslade Bay, Gower where the Ipswichian Raised Beach sits unconformably on Pembroke Limestone Group limestones a gap of about 350 million years ©*SRHowe*