

THE GWYDYR MOUNTAIN CLUB NEWSLETTER – EXTRA!

August 2025: Editor Dave Gray



Introduction

Welcome to the August Newsletter! This is an Extra! edition with an article from Mark Barley on the geology of Anglesey. Many thanks to Mark, Chris Harris, Gill Eccles, Helen Bartlam, Helen Grant, John Driver, Mike Doyle, Ray, Reg, and as ever DLJ for help with this edition. Please let me have material for the next edition, the final deadline for that is **August 22nd**.

Looking Ahead

Here are the upcoming meets venues for August and September, details are on the Club Website. The meets list is constantly being updated, please **check it out regularly** on the Website. Meets added to the programme since the last edition are in bold as a reminder **in case you've missed them....**

2 August	Saturday Walk – Highest Mountain in Anglesey
13 August	Climbing – Penmaenbach Last Butt One Level
15-17 August	Hut Weekend (inc. Mountain Art 'Workshop')
18-22 August	North Wales Climbing (Hut based)
27 August	Climbing – Castle Inn
30 August	Saturday Walk – Aran Fawddwy
5-7 September	Hut Weekend
13 September	Saturday Walk – West Yorkshire: Weets Hill
25 Sept-16 Oct	Sports Climbing Trip to Sicily
26-28 September	Hut Weekend (Work weekend for hut and gardens)

Venues in Focus

The first meet of the month is a Saturday walk taking in **Anglesey's Highest Mountain**. I did this circuit with Glenn and Helen a couple of years back and it's a great varied walk with hill, coast, and countryside elements.

The hill concerned is the highest on the actual *island* of Anglesey, the summit of Yr Arwydd, which lies in the larger hilly area called Mynydd Bodafon, located west of Moelfre on the east

coast. Yr Arwydd/Mynydd Bodafon is then distinct from the highest point in Anglesey *county*, which is Holyhead Mountain on Holy Island.



Mynydd Bodafon (photo <https://ramblersnorthwales.org.uk>)

With that sorted, here's some FAQs on Mynydd Bodafon itself that I hope will encourage you to come along!

It's my first ascent....Will I get a tick on my lists? Yes! Weighing in at 578 feet, Yr Arwydd is listed as Marilyn.

Will I get a tick on my body? Ugh! Hopefully not... Mynydd Bodafon is heathland though so that can't be guaranteed. More welcome wildlife there includes common lizards and adders, and peregrines, choughs, cuckoos, and stonechats. Still even the humble tick is part of the ecosystem I guess...



Will I witness the mighty forces shaping planet earth? Yes if you wait long enough! Like a few million years... For now, if you're in a hurry, the rocks that makes up the bulk of the area are metamorphic schists and quartzites, the latter being sandstone metamorphosed by heat and/or pressure. These rocks are Pre Cambrian, that is older than about 538 million years. Geologists are very excited by rock on the SE flank of the group, which is a conglomerate, i.e. later sediments in which earlier rock – the local quartzite – is welded together. Complex stuff!

<https://www.geomon.co.uk/mynydd-bodafon-rigs-site/> gives a lot of highly technical detail. Here is an extract from the local geological map which shows how

complex it all is!

Will I learn new Welsh words? I learnt two at least writing this piece. Yr Arwydd means 'the sign' or 'the signal' in English. At first I thought the hill might have been a signal station on

the semaphore system that worked between Holyhead and Liverpool in the early 19th century, but not so it seems. I couldn't find any explanation of the name online; my best guess is that maybe the hill was a seamark for mariners.

One other interpretation might be that the name is derived from the Welsh word 'garwedd' which means 'harshness' or 'roughness'. The hill is certainly quite rough ground so maybe. If anyone knows the answer, please say!

Is there a soundtrack to this walk? Kind of. You might go on to YouTube and take your pick from a composition by Alun Hoddinott 1929 – 2008, who was a distinguished Professor of Music at Cardiff University: ‘Op. 87: No. 1. Mynydd Bodafon: Andante’. See

<https://www.youtube.com/watch?v=5lj29ISnHT0>

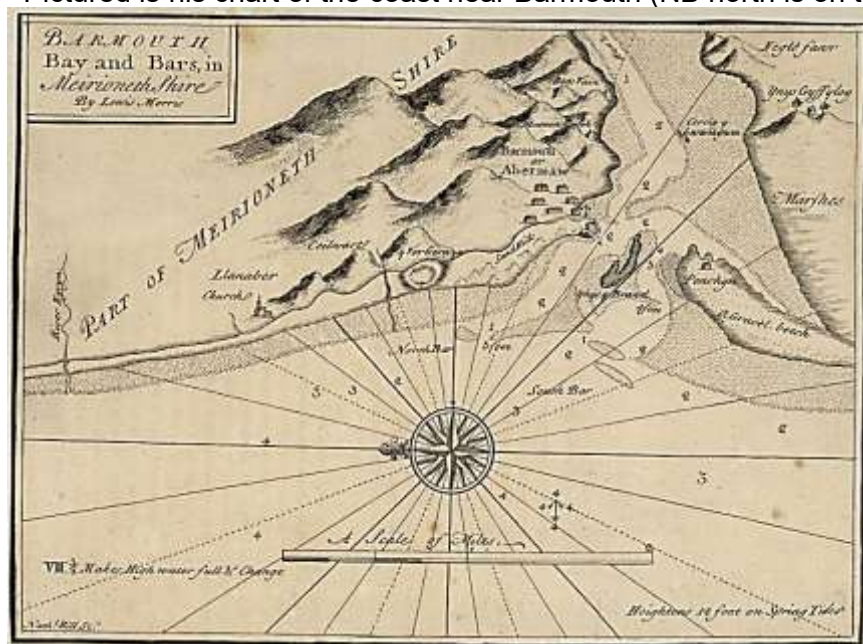
Each to their own but I reckon this piece is truly, truly dreadful. Modernist classical stuff isn't me. Give me a Vivaldi over ice any day.

Or you could try out: 'Mynydd Bodafon' which is a lighter, catchy offering by singer Wil Tan, 'Fireman Will' who is a local singer who's released 5 albums. It's in Welsh, and the influences on Wil are said to be Celtic music, so I guess not surprising I thought it had a country and western feel. Much better than the august professor's work I reckon. See

https://www.youtube.com/watch?v=yogBn6x2ECY&list=RDyogBn6x2ECY&start_radio=1

Are there things to see between the hills and the coastal section of the walk? The website <https://www.inyourarea.co.uk/news/gifted-brothers-from-anglesey-throw-light-on-the-18th-century> explains a monument which we passed on the walk I did with Glenn and Helen, raised to the achievements of four talented 18th century brothers who lived at the nearby farm of Pentre Eirianell. Lewis Morris 1701-1765 was a craftsman, musician, writer, poet, and a surveyor on both land and sea.

Pictured is his chart of the coast near Barmouth (NB north is on the left on this chart). His



brother Richard 1703-1779 was an officer of the Royal Mint and the two worked together to found the Welsh cultural organisation the Cymmrodorion Society which continues to be active today.

Brother William was a customs officer, apothecary and poet. Fourth brother John was master's mate, a warrant officer, on HMS Torbay. He died at the battle of Cartagena –

there were two such battles in the 18th century at different Cartagenas, and I'm not sure which was concerned here.

There's **Hut Meet** in August including a mountain art creative session, which is a great idea.

Helen Bartlam has shared her **most memorable day based on the Hut**, which takes us back to October 2005. One I reckon even I might be able to capture artistically! She writes:



'Well, it was my first time! I'd plucked up the courage to go to the pub on my own to meet people and heard there was something on that weekend. I was invited to join the club weekend meet at the chapel. Things didn't go according to the plot, 'cause it was a dire weather weekend...

Reg and Mike Gavin took me up Moel Siabod. It was thick mist so I couldn't see anything, and the rain was lashing down. I slipped on the boulders below the summit and grazed my leg from the knee down, but the wind was too strong for my cries to be heard by Reg and Mike.

Despite all that, I decided to carry on; you could call it my baptism of fire – but maybe more like a baptism of wind and rain.

And after 20 years I'm still a member!

Those weather conditions in full...my shower wins the Turner Prize!

Now onto **Rock**. There's four climbing meets for the rest of the summer on the programme, three near the A55 and one based at the Hut. One of the A55 venues is **Castle Inn Crag**. I did some idle googling and...



I found this short YouTube video of climbing there https://youtu.be/Wqfbfo_n42k on Route 1 (5a) which is very watchable (video by <https://www.beyondthetrail.uk/>). And at https://www.ukclimbing.com/logbook/crags/castle_inn_quarry-1009/ the Rockfax website writes Castle Inn up as...'tucked away just inland from the coast [it] provides a very popular line-up of low to mid grade sport climbs that are clean, well-bolted, easily accessed and have a lovely outlook.'

Mike Doyle tells me that although Castle Inn was partly a quarry, all the climbing is on natural rock faces.

He's asked me to emphasise that car parking is very limited at the actual crag and it is recommended that the alternative parking noted in 'A55 Sport Climbs, is used. It's only 7 minutes from the main face on a pleasant walk.

The Rockfax entry had led me to this site on the Mynydd Marian area <https://www.conwy.gov.uk/en/Resident/Leisure-sport-and-health/Coast-and-Countryside/Nature-Reserves/Grassland-and-Heathland-Nature-Reserves/Mynydd-Marian.aspx> which gives more detail about its history both natural and human.

And also details of the car parks...which got me thinking about the dense network of footpaths in this area which might yield good new walking in an area I've never explored.

Mike confirms that there's good walking hereabouts. He also recommended a series of guidebooks by David Berry, one of which is 'Best Coastal Walks in North Wales' that goes right from Talacre to Abersoch. He gave me a link <https://kittiwake-books.co.uk/david-berry-m-2.html> that goes to the publisher's website – they have a broad and interesting range of titles.

And that linked in with my thinking about a **new angle for this part of the newsletter. A focus on venues which are not yet Meets...**

What's in my mind is if you've done a walk or visited a climbing venue that would make a good new meet, or a focus for a weekend etc. away, why not send me a few lines saying what it was, what you did, why it was good, and a photo?

And if possible details of the size and location of the parking/ease of access by public transport. (As ever if you haven't photos to hand I can usually get one online)

Grand Days Out (and In) – Recent Meets Highlights

Lots on **at the Hut** recently. John Driver reports 'Some great work done at the hut this weekend. Here's some before and after pics.'



And here's a shot of some of the hard working team on this working weekend garden tidy. Good to see John has his PPE on, and Reg is sporting his 'full dress' baseball hat for the occasion.

Helen grant writes – ‘Thanks Gail for organising the **climbing meet** based at the hut this week. Despite the mixed weather we got some enjoyable climbing done.

- Monday Little Tryfan for trad leading and abseiling refresh.
- Tuesday Beacon indoor climbing given the rivers where in spate and it was wet most of the day 🌧️
- Wednesday We found dry rock at Tremadoc Upper Tier with some nice single pitch routes. 😊

These photos are of Alan on Tremadoc, and of vivid colours and dangling climbers at the Beacon.



We had a marathon Saturday walk on the **Sandstone Trail**, doing the path end to end, with great support from members. Ray writes ‘It was a long day walking 35 miles. We started walking from Whitchurch at 6am and finished at Frodsham around 9pm. I had a few blisters on both feet near the end of the walk. We had support from Derek and Paul who drove us to the start of the walk...supplying drinks and food at Beeston Castle and Delamere Forest, and drove us back home from Frodsham’.

A post from Chris Harris puts the ascent at 3,428 feet.

Gill Eccles described the walk as ‘epic’ and confirmed the whole team finished which was brilliant! Next up is her photo of Rawhead:



And a great atmospheric shot from Ray of Richard with Beeston Castle in the background:



EXTRA!

THE FASCINATING GEOLOGY OF ANGLESEY: AN INTRODUCTION by Mark Barley

Anglesey, the largest island in Wales, is a geological wonderland with a history stretching back hundreds of millions of years. Its landscape tells a story of ancient oceans, dramatic tectonic movements, and glacial reshaping. Anglesey is a UNESCO recognised GeoPark (one of 220 worldwide) called GeoMon, whose headquarters and visitor centre are based in the Watch House at Amlwch port.

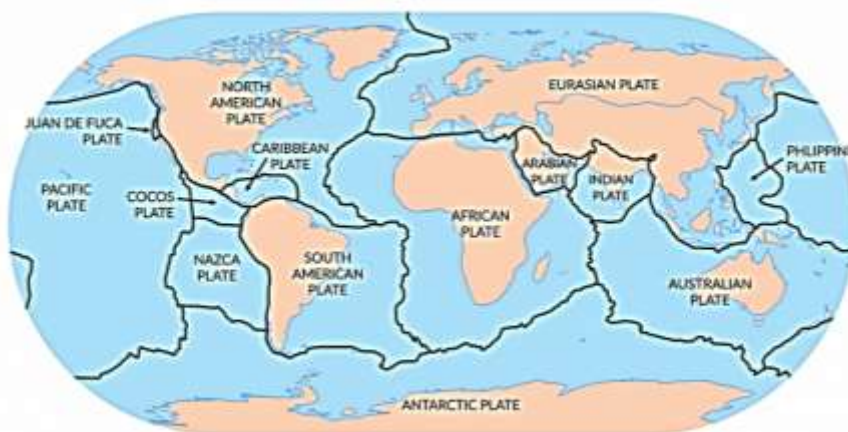
The Club has often been to Anglesey and the subject of geology usually comes up. This May I organised a field study trip for some friends, and did some research to prepare the ground.

In this article, we'll explore the island's geological past and highlight several of its most striking features. A lot of this revolves around the theory of plate tectonics and so...

A Brief Word about Plate Tectonics

Since the 1960s geology has been dominated by the theory (for which there is now copious evidence) of plate tectonics. According to this theory Earth's outermost layer, called the **lithosphere**, isn't one solid shell, but rather a giant jigsaw puzzle made up of several enormous pieces, called **tectonic plates**, which are usually a combination of oceanic and continental crust (see map below, credit (www.earthhow.com)).

These plates are constantly, though very slowly (about the speed at which your fingernails grow), moving across the Earth's surface on the much hotter, softer, and slowly flowing layer beneath them, called the **asthenosphere** (part of the Mantle).



Plates usually grow at mid-oceanic ridges where an upwelling of magma forms new rock into mid-oceanic ridges and islands (e.g. Iceland and the mid-Atlantic ridge). These are **divergent** plate boundaries and the plates are thrust apart.

In broad terms, this means something has to give on the far side of the plates. What happens on the far side is that each plate is 'subducted' or thrust under its neighbour, back into the molten asthenosphere and its rocks are recycled. If a plate edge that is oceanic rock meets an edge which is a continent, the denser oceanic rock gets subducted. If two oceanic plates meet, one will inevitably get subducted under the other. In the first case the subduction creates a deep ocean trench, a rash of volcanoes, and new mountains (e.g. The

Andes). In the second case we get an ocean trench and new volcanic islands – like Japan – are created. The final situation is where two continental edges meet, and then the plates are not subducted but crash and crumble into new mountains – (e.g. the Himalayas and Tibet).

The term **convergent** plate boundary applies to all three cases, and all cases involve potential changes to the rocks concerned because of intense heat and pressure.

The challenge in trying to understand the geology of Anglesey (as it is for any location) is to explain the observed features in terms of this over-arching theory of how the earth has behaved over the last several hundred million years.

A Brief Geological History of Anglesey

Anglesey's geology is among the most complex in Britain. The island is composed of multiple terranes—distinct geological fragments that were once part of different landmasses. These terranes were brought together by powerful tectonic forces over hundreds of millions of years, creating a diverse and intriguing geological landscape.

The oldest rocks on Anglesey (the Mona Complex) date back to the late Precambrian era, over 600 million years ago (MYA), and are incredibly diverse and often intensely deformed. These ancient formations, are unique to Anglesey (and a small section of the Llyn peninsula) and provide much of the most interesting geology on the island.

Unravelling the precise history of the Mona Complex has been a long and ongoing endeavour for geologists. The intense folding, faulting, and metamorphism (alteration by heat and pressure) these rocks have undergone over eons have obscured their original relationships. However, through meticulous fieldwork and advanced analytical techniques, scientists have pieced together a picture of dynamic tectonic activity with plates colliding and rifting apart, volcanoes erupting beneath the waves, and mountain ranges rising and eroding. However great uncertainties remain. For example, the Mona complex is both very old (up to 600MY) and mainly composed of metamorphic rocks. This means that fossils are very rare so there is great uncertainty as to the age of the different strata. Typically, the ages for rocks of the Mona complex are somewhere between 400 and 600MY.

The variety within the Mona Complex is striking. You can find schists, gneisses, quartzites, and various volcanic rocks, each with its own unique mineral composition and texture, reflecting the diverse geological environments in which they formed. These ancient rocks provide invaluable insights into the early evolution of our planet and the processes that shaped the continents we know today.

During the Ordovician and Silurian periods (487-420MYA), the Earth's plates were very different to those of today. Anglesey (together with the rest of England and Wales) was part of the Avalonian microcontinent, which drifted northward as the ancient Iapetus Ocean closed. The plate forming the bed of the Iapetus ocean was being forced (subducted) underneath the continental plate Laurentia (which included Scotland). When this process was completed at the end of the Silurian (about 420MYA) it resulted in the formation of the British Isles as England/Wales was welded onto Scotland.

Later, during the Carboniferous period (360-300MYA), Anglesey was submerged beneath a shallow tropical sea, leading to the deposition of limestone and other sedimentary rocks. The island's landscape was further shaped by glaciation during the Pleistocene epoch (2.6MYA-12,000YA), when massive ice sheets carved valleys and deposited thick layers of glacial till.

We'll now explore five varied areas of geology on the island...

1) **Parys Mountain: A Colourful Testament to Hydrothermal Activity**

Parys Mountain, located in the northeast of Anglesey, is a geological marvel. The mountain is renowned for its rich copper deposits, which were mined extensively in the 18th and 19th centuries. In the 1780s it was the largest copper mine in Europe.



The colourful landscape, dominated by vibrant hues of red, yellow, orange, and purple, is a direct result of the mineralization that occurred here during the Ordovician period, around 450MYA. Hot, metal-rich fluids, heated by volcanic activity deep beneath the surface, rose through fractures in the rocks. As these fluids cooled and reacted with the surrounding rocks, they deposited a rich variety of metal sulphides, including copper, lead, zinc, and iron. The colours we see today are the result of the oxidation and hydration of these minerals, as they are progressively weathered by air and water respectively.

The mining operations at Parys Mountain left a lasting impact on the landscape, with deep open pits and underground workings. Today, the site is a popular destination for geologists and history enthusiasts alike, offering a window into both the island's industrial past and its geological heritage.

2) **The Pillow Lavas of Llanddwyn: Frozen Testimony of Underwater Eruptions**

Just north of Llanddwyn Island, on the southwestern tip of Anglesey, lies a remarkable display of pillow lavas. These distinctive, rounded rock formations are instantly recognizable and offer a compelling glimpse into ancient underwater volcanic activity.

Pillow lavas form when molten lava erupts onto the seafloor. The rapid cooling by the surrounding water causes the lava to solidify quickly into characteristic pillow-like shapes, often with a glassy outer crust and a more crystalline interior. As subsequent lava flows erupt

on top, they mould themselves around the existing "pillows," creating an interlocking structure.

These pillow lavas are part of the Mona Complex and provide direct evidence of volcanic eruptions occurring beneath an ancient ocean. Pillow lavas rocks provide an insight into deep ocean geology, as they are normally recycled back into the Earth's interior as part of a subducted plate. In this case the pillow lavas at Llanddwyn were broken off the descending plate and mixed with the sedimentary rocks on the edge of the overlying continent, allowing us to study them today.



3) The Gwna Mélange

The Gwna Mélange is a chaotic geological formation found along Anglesey's northern coast and is part of the Precambrian Mona complex. It consists of a jumble of different rock types, all mixed together in a seemingly random fashion. For example, at Llanbadrig on the north coast, a short walk of less than half a mile will take you past limestone, then phyllite (compressed mud changed by heat and pressure to a degree greater than slate but less than schist) and then quartzite (metamorphosed sandstone). Phyllite and quartzite are metamorphic rocks that can only be formed by large scale heat and pressure for a prolonged time. Limestone is a sedimentary rock, if it had been subjected to similar heat and pressure it would now be marble. It is unusual to find such rocks in close proximity. This photo at Llanbadrig shows white quartzite in front of dark Phyllite.



This unusual formation is believed to have formed in an ancient subduction zone, where sediments and rocks with different histories were mixed up in an underwater landslide that fell into the deep submarine trench associated with a descending oceanic plate. However, rather than going down with the plate into the depths of the earth, these rocks were scraped off onto the overlying continental plate.



4) Blueschist at Llanfairpwllgwyngyll

One of Anglesey's most remarkable geological features is its blueschist, found near the Marquess of Anglesey's statue in Llanfairpwllgwyngyll (pictured left). Blueschist is a rare metamorphic rock that forms under high-pressure, low-temperature conditions in plate tectonic subduction zones. It is quite different from the much more common greenschist and is grey-blue in colour due to a blue mineral: glaucophane.

The blueschist on Anglesey is around 570 million years old, making it one of the oldest examples of this rock type in the world. One theory about its formation suggests that it was formed from pillow lavas that were subducted deep into the

Earth's mantle and transformed by intense geological forces. The presence of blueschist on Anglesey provides crucial evidence of plate tectonic activity happening that long ago – the exact time in the earth's history when such activity started is still unknown.

5) Holyhead Quartzite and Greenschist at Amlwch.

Finally, we can illustrate Anglesey's geological contrasts by looking at its two principal port towns.

At Holyhead Breakwater park the local quartzite (a metamorphosed pure sandstone) was used to build a huge breakwater for Holyhead harbour, and also processed to make high silica fire bricks to line furnaces. Holyhead mountain is formed from this rock which is part of the Mona complex. Quartzite can have a sugary texture sometimes seen in marble but it is much harder.

In contrast the local rocks around Amlwch port are greenschists from the New Harbour Formation (also part of the Mona complex). These rocks, that are formed from compressed mud and clays that have then been metamorphosed to a higher degree than slate or phyllite, show a layered structure and a glistening surface due to the layers of mica formed during the metamorphic process. The green grey colour is due to the presence of green minerals such as chlorite.

Quartzite, Holyhead



Greenschist, Amlwch

Conclusion

Anglesey's geology is a tapestry of ancient oceans, tectonic collisions, and glacial reshaping. From the rare blueschist of Llanfairpwllgwyngyll to the chaotic Gwna Mélange and the mineral-rich Parys Mountain, the island offers a wealth of geological interest for enthusiasts and visitors alike.

Whether you're a seasoned geologist or simply curious about the natural world, Anglesey's rocks tell a story that spans hundreds of millions of years—a story of dramatic change, resilience, and the powerful forces that shape our planet.

You'll see from my byline below that I decided to use this opportunity to see how well using AI as a tool to write reliable material worked in practice. For those interested in the use of this new resource, I've summarised my personal experience and observations below!

Mark Barley (with help from Google Gemini, Le Chat and Microsoft Co-pilot)

June 2024

Using AI - what I did plus some pro's and con's

To start this article I asked the three AI algorithms listed above to 'Write a 1000 word article with references suitable for a lay audience about the geology of Anglesey. Include the three most interesting geological features'.

All three selected Parys Mountain, and two algorithms selected pillow lavas (though Google Gemini placed them in Rhosneigr) and/or Gwna melange; all geological features unique to Anglesey. While Le Chat and Co-pilot produced similar content and quoted Wikipedia and GeoMon websites as references, Google Gemini used more obscure sources and highlighted rocks found in faults on the mainland side of the Menai strait as one of its three interesting features.

I knew that if you asked the same question twice you may get a different answer, so I reran Google Gemini and got a reference to the Gwna melange (but renamed the Holyhead melange), pillow lavas associated with Gwna greenstones (I can find no independent reference to these), plus a detailed and correct description of limestone pavement. Limestone is found in the eastern part of the island, but I haven't seen any limestone pavement there and I'm sure far better examples are found in the Peak District and Yorkshire Dales.

In summary I took most material from the script generated by Co-pilot. All the scripts tended to gush, speak in generalities, and avoided stating hard facts. The script from Le Chat was particularly waffly and full of generalisations. Google Gemini was most prone to getting facts wrong but also off target in selecting the three best geological features. Having said this the advantage to using AI is that a script (or several) is produced in seconds to start work on, but you do need to check everything very carefully, and be prepared for a thorough editing process!

Mark Barley

July 2025