Geologists' Association - South Wales Group

Cymdeithas y Daearegwyr - Grŵp De Cymru

Newsletter August 2021 **Sixty second session**

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I don't know about you but I'm feeling cautiously optimistic that we may be through the worst of the pandemic. Recently I've been lucky enough to catch up with friends in person and I've even been back out in the field in the last few weeks which all helps to make me feel like life is starting to return to some sense of normal. Obviously we are still subject by the uncertainties that COVID continues to bring but even so, Stephen has pulled together a hopeful programme of events for the summer and a programme of lectures for the winter is starting to come together. You may well have seen articles in the news about a new dinosaur footprint at Bendricks Bay. Our own Cindy Howells has been involved in acquiring the fossil for the museum and she has kindly written a short article about this which is at the end of this newsletter.

I hope this newsletter finds you as well as you can be and I sincerely hope to see you all as soon as are allowed! Rhian

SWGA SUMMER PROGRAMME 2021

With the advent of the Covid vaccination programme and the easing of some of the Covid restrictions we have been able to hold the first three field meetings of the summer programme as planned. To date we have had to restrict participants to 20, in order to ensure that we can observe the social distancing guidelines, and have had to insist on pre-booking and full contact details of all participants for a track and trace record in case it was ever needed. However, with the relaxation of most of the restrictions on 7th August, especially in relation to meeting outdoors, we will no longer be restricting numbers attending field meetings unless the trip leader requests that we do. So, unless the leader requests a limit there will be no need to book a place on an excursion in advance and we will no longer be taking track and trace information. However, it has proved useful to know who intends coming on each trip as then we know to wait at the start for anybody who has got held up on their journey.

Therefore, if you do intend coming it would be very helpful if you could continue to let Nick know in advance.

The remaining summer field excursions are as follows:

Saturday 4th September. *Brown's Folly, Bathford and Tucking Mill – in the steps of William Smith*

Leader: Maurice Tucker (University of Bristol)

Meet at 10.30 am at Brown's Folly Nature Reserve car park at Bathford (ST 798 663; Post-code: near BA1 8EA) off the A363 just to the east of Bath. The excursion will finish around 4.30 pm.

Brown's Folly is an Avon Wildlife Nature Reserve, designated an SSSI for its flower-rich grasslands, ancient woodlands and remains of Bath Stone quarries. The exposures provide some of the best outcrops of the Chalford Oolite Formation (Great Oolite Group), where the features of the various units can be seen. The paths may be muddy and there are steep steps.

For lunch, we will drive to the Canal & River Trust Brassknocker Basin/ Angel Fish Café, near Limpley Stoke. This is where the Somerset Coal Canal (a William Smith project) joins the Kennett & Avon Canal and is close to the wonderful Dundas aqueduct. We will then drive to Combe Down, where we will walk down Summer Lane to see William Smith's quarry, then down to his mill-site and house at Tucking Mill via the tramway that Smith constructed to carry stone to the canal, seeing the Inferior Oolite and Bridport Sands on the way. We will then return via the old Somerset & Dorset railway line, now a cycle-way, to Combe Down.

Lunch will be taken at the Canal & River Trust Brassknocker Basin/ Angel Fish Café, where there are toilets. It is recommended to bring a packed lunch and change for the Pay and Display Parking. Drinks and food can be purchased at the café.

From Browns Folly to the lunch stop, drive SSE to Monkton Farleigh, then turn right onto the A363 and left towards Bradford on Avon. At a small roundabout, take the B3108 towards Winsley and Limpley Stoke; the Brassknocker Basin is on the right before the A36.

After lunch, drive to Combe Down, through Monkton Combe, parking in Beechwood Road, postcode BA2 5JS.

Sunday 10th October. *Broughton and Whiteford bays, West Gower*

Leader: Gareth George

Meet at 10.30am at the Whiteford Beach car park in Llanmadoc, Gower (SS 439 945). To find the car park drive through the village until you reach the church then take the right-hand fork down the hill (marked a no-through road). The car park is in the field on the right just below the church. There is a £1 honesty box car parking charge.

On the excursion we will walk from Broughton Beach, via Twlc Point, to Prissen's Tor, Hill's Tor and on to Whiteford Bay and will be looking at the Pembroke Limestone Group succession as well as the

submerged forest, dunes and beach processes etc. A fuller itinerary will be distributed closer to the trip.

WINTER PROGRAMME 2021-2

We still have no indication from Cardiff or Swansea Universities as to when we might be able to start using their lecture theatres once again and, at the time of writing, it is looking extremely unlikely that we will be able to do so before Christmas. Because of this the Committee has made the decision that all of the lectures for the first half of the winter session, up to and including December, will be held by Zoom. We are hoping that we may be able to meet again in the flesh in the New Year and have planned the lecture programme on that basis. However, if the venues are still unobtainable by January then the rest of the session's lectures and *Holiday Geology* will also be held via Zoom.

One bonus for having to resort to on-line lectures is that we are able to invite speakers from much farther afield than would be the case if they were delivering their talk in person. The winter lecture programme next session is a joint venture by members of the Committee who have been contacting various colleagues from around the country to elicit talks for the programme. This is still being finalised but the current dates for your diary are:

- **Saturday 23rd October 2021 (*Zoom*) - *Tbc***
- **Saturday 20th November 2021 (*Zoom*) - *The Cambrian Explosion:*** *Rachel Woods (University of Edinburgh)*
- **Saturday 11th December 2021 (*Zoom*) - *Tbc***
- **Saturday 8th January 2022 - *Holiday Geology***
- **Saturday 22nd January 2022 (*Cardiff*) - *Title tbc.*** Kevin Privett (SWGA)
- **Saturday 19th February (*Swansea*) - *The Red Rocks of Pembrokeshire:*** Brian Williams
- **Saturday 19th March 2022 (*Cardiff*) - *AGM and Presidential Address:*** Chris Lee.

THE GA FESTIVAL OF GEOLOGY 2021

The GA's annual *Festival of Geology*, normally held at University College, London will once again be a virtual event this year and will take place on **Saturday 6th November**. The Group usually attends this event in person and takes along a display as well as items for sale. Last year, we took part in the virtual meeting as those of you who logged on to the meeting that weekend will have seen and so, no doubt, we will be doing likewise this year. Full details of how to access the virtual festival will be distributed in due course.

Geological Events at a computer near you!

Many geological organisations have moved their events on line which means that there are raft of lectures and workshops to get involved with.

- The geologists Association have their geology you're your sofa section on their website which is packed full of information about free lectures to attend or download. There are even online workshops to get involved with: https://geologistsassociation.org.uk/sofageology/
- **Earth Heritage Magazine** This is now only available as an electronic copy. Here is the link: http://
- www.earthheritage.org.uk/wp/wp-content/uploads/EH-53_final.pdf
- If you are a regular visitor to our website: www.swga.org.uk you may have noticed that we have been putting recordings of our own lectures on line, just for a few months after they are recorded. If you need help getting up and running with Zoom, we've also put a guide on our website or you are welcome to email me and I'll try and help.
- You might also be interested to learn that we now have a YouTube channel and we also maintain Facebook (https://www.facebook.com/groups/179899022064977) and Twitter accounts (@swgeologists). With Facebook and Twitter, anyone can join in and the more that do, the better it is!

Join the committee!

Stephen Howe has been our programme secretary for many years and now wants to stand down (after quite a few years of only saying just one more year…) also, Caroline, our Membership Secretary, would like to step down next year so we will be looking for someone to step forward to replace her. If joining the committee is something you think you could do, please get in touch to find out more about the roles. You're help would be very much appreciated.

Other Geological Organisations

- Russell Society, Wales and West Branch: Tom Cotterell. Tel: 01594 845935 before 9 pm
- Welsh Stone Forum (Fforwm Cerrig Cymru): Tim Palmer tjp@aber.ac.uk or www.museumwales.ac.uk/en/welshstoneforum
- Open University Geological Society: Norman Nimmo Smith ougs.org.uk/severnside
- West Wales Geology Society: www.westwalesgeolsoc.org.uk
- South East Wales RIGS : http://sewrigs.wordpress.com/

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New dinosaur footprints in south Wales

Bendricks Bay, near Barry is sometimes thought of as being a bit of a local secret, with its dinosaur trackways. It's usually quite quiet to visit, with just a few fishermen or dog-walkers, but it may surprise you to know that it's one of the most important Upper Triassic footprint sites this side of the Atlantic.

The first dinosaur print in Wales was found in 1879, but the Barry site wasn't noticed until almost 100 years later. These footprints date back to around 220 million years or so – although dating them exactly is not easy as there are no body fossils to help. This was the Norian age – a time when Wales was just north of the equator, covered by hot deserts, and subject to very occasional intense rainfall episodes with floods of mud and debris pouring down from the hills.

Dinosaurs were just one of several groups of reptiles that had recently started to diversify, and left their footprints in the damp mud and sand after such flooding events. It is however, very difficult to establish exactly which reptile made any particular trackway, so palaeontologists have developed a system whereby the shape and size of the footprint is named, rather than the animal that made it. All new discoveries are very useful to help to build a more complete picture of the sort of animals that inhabited an area, and may eventually lead to us being able to pinpoint some of them more accurately.

The trackways at Bendricks Bay consist of four or five different types that have been found so far. Two varieties show a tridactyl (three toed) animal with long straight toes, the central one being much longer than the others. We can match those fairly well with the feet of theropods, or meat-eating dinosaurs. *Anchisauripus* is a medium sized print - around 20cm long, and *Grallator* is about half the size but of a similar shape.

Other footprints seem to indicate that the animals might have been prosauropod dinosaurs (plant-eaters). These include the nice quadrupedal trackway (showing both pes and manus, or foot and hand prints) that was seen and cast in the 1990s by the National Museum of Wales. There are also some that just show bipedal prints but with shorter curved or straight toes. *Eosauropus* is the current name for the larger quadrupedal prints, with outwardly rotated curved toes – although the hand (or manus) print is sometimes obscured by that of the foot (pes) so it might appear bipedal. *Evazoum* refers to the smaller (c.10cm) prints which usually appear to have three fairly straight toes, although a faint thumb print is occasionally preserved.

Of course the appearance of the footprints is further complicated by factors such as the depth and wetness of the mud in which they were made, and whether we are actually seeing the original ground surface, or an 'underprint' from a layer below the surface. Both these factors can greatly influence the size, shape, clarity and angle of toes seen in any print, and accounts for the vast number of squelchy looking, vaguely oval, depressions in the rocks here.

So when four-year old Lily Wilder, out walking with her father in January 2021, spotted a dinosaur footprint in a loose block at Bendricks, it was with some trepidation that I investigated further. Most so-called prints are usually just erosional features. This one was stunning though! It appears to have been made in a fairly thin layer of just-damp mud, and shows clear muscle pads and claw impressions. Unfortunately, the fossil had been initially posted on a UK-wide Facebook group, and so there had been quite a bit of interest before the family was advised to remove the post and contact us.

My first thought, after establishing that it was a footprint, was to contact both *Natural Resources Wales* (NRW), and also the *British Institute for Geological Conservation* (BIGC). Bendricks Bay is an SSSI, and so is theoretically protected from fossil collecting, and is both owned and managed by BIGC. However, NRW who oversee Welsh SSSI's are vastly underfunded and understaffed, so that in practice they don't achieve nearly as much time out in the field checking these sites as they would like. The BIGC representative also checks the site as often as possible, but inevitably damage has been caused by some individuals, despite a potential maximum fine of £20,000 being applicable.

After I notified both NRW and BIGC of this find, the wheels very quickly started moving, and within two days we had both permission and the method to remove the fossil to safety, and I must give my thanks to the people who helped with this. Luckily the footprint was on a loose block, well away from the cliff, so there was no need to hammer or saw at the main rock ledges.

Very unfortunately, the local press had quickly been notified of the find, so that we had to work very quickly. An official press release was prepared by the museum, with quotes from all bodies, and the press were asked to sit on the news until the following weekend, which they reluctantly agreed to do. As you might expect, the story of a 4-year finding a fossil dinosaur print caused immense interest around the world, and the family were initially surprised by the many interview requests from national and international channels. Despite our best intentions, the press concentrated on the public interest side of the story, and our concerns about the safety of the site were glossed over. Immediately we heard reports of people with sledge-hammers and crow bars descending on the beach, along with criticism in social media of 'why hadn't we kept our local secret safe?.

There was some damage to rock ledges with sections being levered up and smashed, although luckily this seemed to have been confined to just that first wave of enthusiasm. We did find a large bolster chisel wedged into a crack at the back of a block which must have weighed a good 30 tonnes or so! This sort of damage causes more than just immediate physical vandalism – it has also caused a strain in the relationship between the museum and BIGC who rightly feel that their wishes for site anonymity were somewhat ignored. A difficult situation all round! Please take all opportunities to remind geological friends and family that hammering is not permitted at many sites, and that responsible collecting is the future for us all.

So what about the footprint itself? It's 11cm long, with three obvious straight toes, of roughly equal length, so this equates it to *Evazoum*, and indeed looking at it with the eye of faith, one can make out what might be a tiny thumb-claw impression in about the right place. It also shows a characteristic large muscle pad at the base of digit 2. Looking at the entire block under better lighting, we can also now see a second print ahead of the first one. So we have a right, left trackway of two prints, and can use measurements to establish an initial estimate of a dinosaur that was almost 50cm tall (at the hip), and walking along at around 3 miles an hour.

The specimen is currently on display in the Main Hall of the National Museum of Wales, in a display called 'Lily's Fossil Footprint'. It's a display aimed at younger children, so you won't find much in the way of scientific detail. However, I do intend to do some photogrammetry of the block and with that, initiate research into the different footprints we have in south Wales, trying to establish whether this *Evazoum* print is the same, or different from, the two currently known species – from the USA and Italy. So do visit the new display, and also take a look at the other footprints from the same site, on display in the *Evolution of Wales* exhibition.

Cindy Howells (Palaeontology Curator, National Museum, Cardiff)