# Dorset GA Group

## Newsletter Spring 2022

https://dorsetgeologistsassociation.org/

### Contents



### Welcome to the Spring Newsletter!

As I write this it is not Spring yet but we have it all to look forward to! As you'll see from the last 2 pages, our new Field Trip Officer and new Events Officer have already been busy on your behalf. I hope attendances at events will now start to pick up and that you'll support them if you are at all able to. I've been able to include a wide range of articles this time with some new contributors featuring. It would be good if this continues with even more members getting their name in print. As ever, thanks to everyone who has made this slightly longer edition a pleasure to put together.

*Kelvin*

Continuing the series of reports from the Black Country Field Trip, *Sarah Skinner* covers the:

### Dudley Canal Tunnel and the Singing Cavern

**Subterranean canal boat trip to the underground limestone quarries:**
A narrowboat tour through the Dudley 'No.1 Canal' tunnel to Singing Cavern, in the limestone quarries beneath Castle Hill, does not disappoint. Hard hats and a sense of humour are all that is needed, appreciating the enthusiasm of the driver from the Dudley Canal Trust as our boat prepares to enter narrow Lord Ward's tunnel at the start of the trip. It was the Trust, in collaboration with the local council, who rescued the unique 18th-century subterranean canals from certain decay in the 1960s.

**Fig 1. Narrowboat leaving the Portal for the entrance into Ward's Tunnel**

Serving the growth of industry the canals carried limestone, used in iron smelting, direct from the quarries to the furnaces. Almost 14,000 people attended the re-opening of the Dudley Tunnel at Castle Hill in 1973, and as visitors increased, a new tunnel was built in the late 1980s to Singing Cavern, allowing a round route for the boats. The Portal hub opened in 2016, to welcome tourists, schools and geologists to one of the Geopark's most popular sites. When the Singing Cavern is not open for geo-tourists, it may well be hosting weddings or Santa grottos.

**Geology and industrial heritage:**

**Immense periods of geological time from over 425 million years ago are showcased, and fossil records exposed, in the tunnels and caverns beneath Castle Hill, geologically most closely associated with the adjacent Wren's Nest site.** Together the limestones and mudstones of the Silurian period and the Carboniferous coal of this area, comprise the Black Country coalfields. Castle Hill represents an anticline rising from low-lying South Staffordshire. Millions of years after deposition, the limestone rocks were pushed up as a result of ancient Late Carboniferous tectonic forces, creating hills at Dudley and the outcrops on the Welsh Borders.

Geologists and the curious have been attracted to the limestone mines since Victorian times. This is where Sir Roderick Murchison (leading geologist of the day) and the British Association for the Advancement of Science, visited Dark Cavern in 1849. He delivered his subterranean lecture on the Silurian System, which he had established based in part on studies of the Dudley Hills and the tiny trilobite and other fossils exposed by mining activity. A journal describes “a goodly gathering mustered round him as he led them into the Dudley caverns….lighted up for the occasion. There he gave them .... the story of the ancient sea-formed rock within which they were assembled..”

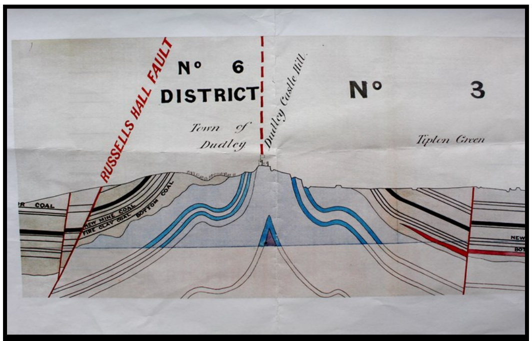


**Fig 2. An original cross-section drawing from the 1860s.**

The Much Wenlock Limestone Formation at Dudley contains the most diverse and abundant fossil fauna in the British Isles: over 600 species of marine invertebrate (some 29 major taxonomic groups). Exposed ripple beds and coral knolls tell part of the story as quarrying in this area cut through a fossil coral reef.  Structural features of the Castle Hill anticline (N-S axis) are demonstrated in the dipping limestone beds poking through the later coal layers laid down 318 Ma.

The local juxtaposing of coal, limestone and iron ore fed thousands of furnaces in the Industrial Revolution, which demanded a network of canals around Birmingham and the Black Country.  At Castle Hill, limestone was loaded into barges from the underground quarries. The first tunnels here in the 1770s, branched from the Birmingham Canal, and meant new quarries could be opened up. Surface quarrying needed to go deeper to obtain the desired quality of limestone, as nodular limestone is too impure for uses as flux in iron smelting and was thus not quarried.

Singing Cavern got its name from the cold winds humming through the passages, and was last worked in the early 19thC. The canal extended further in than it does now, as over the years there have been collapses. About 90m of cavern remains, but at one time the cavern itself, with a tramway along it, ended up near the centre of Dudley. Seven limestone pillars support the roof, each weighing 300 tons and two loading shafts.

Watched from our barge, alongside an underground wharf, an audio-visual display in Singing Cavern tells visitors of the mining heritage, the geology, the social legacies, the rock bands (of the musical type!) it inspired, and the Geopark achievement of UNESCO status in 2020.

**Building the Dudley Canal and Tunnel:**

During the 18th-century many mine owners and crystal manufacturers contributed financially to canal construction. Canals progressed at a pace. For the glassmaking industry they also brought in fine silica sand, red lead oxide, potash and saltpetre. They carried finished products from heavy machinery to domestic ironware to glass, to markets in Britain and to the ports. Canal companies competed with each other and Acts of Parliament were passed to authorise construction.

The Dudley Canal connected the Dudley coalfields to the canals at Stourbridge to the south, and the iron and glass industries there. Raw materials went from mines to canalside furnaces and workshops. Proposed in 1775 as a single canal, the Stourbridge and Dudley Canals met fierce opposition from the Birmingham Canals. The first phase of the canal was largely complete by 1779, although it was another two years before it was finished.  At the same time, Lord Dudley (Lord Ward of Dudley) began building a private canal branching from the Birmingham Canal at Tipton, east of Dudley, to his Tipton colliery which was reached through a tunnel. Then a 210m tunnel was built to his new limestone quarry deep under Castle Hill. Known as Lord Ward’s Canal and Tunnel, the branch from Tipton to Castle Mill basin was completed in 1778.

Requiring an extension to join the Birmingham Canal north of Dudley, the Dudley Canal involved a long tunnel ambitiously constructed under Castle Hill for nearly 3km in a SSW direction.

It incorporated Lord Dudley's branch canals, and widened Castle Mill basin to form a junction that was created by deliberately collapsing a cavern roof and flooding the bottom.

By 1792 the Dudley Canal Tunnel was open to traffic. It is the second longest navigable canal tunnel in the UK today, and the main tunnel is approximately 2.7km long.  Another ambitious extension linking the southern end of tunnel to the Worcester and Birmingham Canal (at Selly Oak) was built over the next six years. The original canal and tunnel became known as the Dudley No.1 Canal.

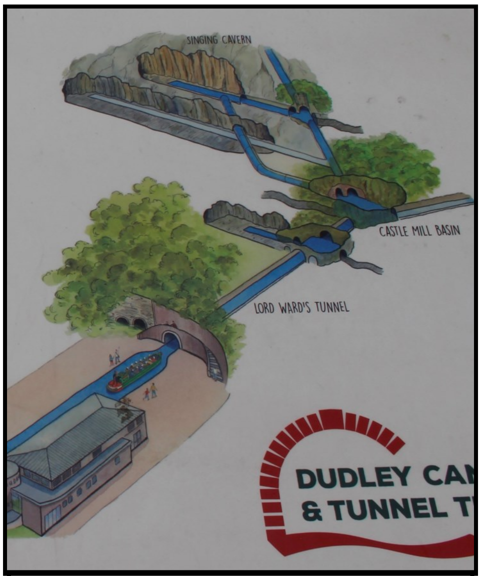



**Fig 3. The Dudley Canal tunnels at Castle Hill (diagram)**

Our narrowboat squeezes through Lord Ward's Tunnel, lined with blue engineering bricks made of fine Staffordshire clay. We quickly emerge into the open canal basins that were once mined caverns. They form water-filled holes effectively 'inside' Castle Hill but open to the sky, with steep vegetated sides. Four tunnel entrances lead off Castle Mill Basin and our barge glides into the one completed in 1989 that goes direct to Singing Cavern, the boats returning via an older loop.

**Much Wenlock Limestone succession at Castle Hill:**
The entire Much Wenlock Limestone succession is revealed in a series of discrete underground exposures, at varying depths beneath Castle Hill and linked by the waterways. The Coalbrookdale Formation are the oldest rocks. Quarried Much Wenlock Limestone formed 425 Ma., and overall deposition was in a shallow, tropical marine sea located about 23°S of the Equator. The sea level fell somewhat from the time of the Coalbrookdale Formation deposition to the succeeding Lower Quarried Limestone, which would have formed in shallower and clearer water.

**Fig 4. Inside Lord Ward's Tunnel**

Along a 1.6km boat journey can be seen sections of the Coalbrookdale Formation (silty mudstone with some calcareous siltstones and containing calcareous nodules), underlying the Much Wenlock Limestone (Lower Quarried Limestone, Nodular Beds and Upper Quarried Limestone 'pure limestone' members), to the younger Lower Elton Formation (the silty, mostly calcareous shales above). Some horizons are highly fossiliferous, with assemblages dominated by brachiopods with trilobites, solitary corals and cephalopods.

**Fig 5. Castle Mill Basin**

The brick tunnel lining hides some exposures, others can be seen in passages simply hacked from the rock. In the newer tunnel to Singing Cavern connecting directly from Castle Mill, the older strata of the Coalbrookdale Formation are obscured by ‘egg box’ construction concrete lining. Singing Cavern itself is entirely excavated in the Upper Quarried Limestone Member, giving a superb exposure. 'Little Tess' mine is also Upper Quarried Limestone, Castle Mill Basin exposes the Lower Quarried Limestone Member. Where the canal tunnel goes through the axial fault of Castle Hill, it is marked by a tunnel section supported by steel colliery arches. Next to it, the small Little Tess cavern is the first exposure on the western side of the anticline; beds now inclined to the west. From here the journey is stratigraphically upwards through the Nodular Beds Member in ‘Rock Tunnel’ partly obscured by shotcrete and calcite deposits (speleothems). Of interest are the thick bentonite beds in the Coalbrookdale, recording ash falls from distant volcanoes, and evidenced by deep grooves along the sides of the short winding tunnel.

**Working conditions:**
Conditions for miners were grim and life expectancy was short (even as low as an average of 30 in the 18thC). Boys of 9, girls of 12 were employed, both in mining underground and to make the millions of bricks to line the tunnels. Staffordshire clay, transported via the Staffordshire waterways, was used for the blue ‘toccy bricks'. The fine pores of the clay gave superior water-tight properties, when baked at high temperatures they were virtually impervious to water.

Underground and overground accidents were common, dust destroyed lungs, skin diseases and blindness resulted from lack of sunlight and rickets was common. On our tour, away from the tunnel entrances we are reminded of the pitch black when the torches are switched off. Navvies dug rock by hand working by candlelight in the cold, made worse by piercing draughts. Depending on the dip of the limestone beds, mining was carried out using the pillar and stall method. As much as possible of the required rock was removed and pillars left to hold up the roof.

Later canals and tunnels were wider, but here men on their backs would have 'legged' the boats through the tunnels, building momentum pushing their feet against the bricks (one man could push a 30 ton boat, even a convoy). It could take about 2 hours to get through. The Earl of Dudley banned the use of barge-poles as they damaged the bricks!

Generally, partly due to fault lines in the rocks of the area and to the haste of canal building, frequent maintenance was needed, pumps to control water levels, and repairs to collapsed sections of tunnel. Dudley Tunnel southern section was affected by mining subsidence throughout its existence.

**Fig 6. One of the smaller limestone caverns displays a dramatic mining scene**

During the following decades traffic increased, at one time over 40,000 boats a year may have passed through the Dudley Tunnel. Sometimes three-week queues would build up, over 3 miles long, and the narrow tunnel allowed only one boat direction. Congestion on this scale was intolerable, impeding the limestone boats and bringing complaints from through traffic.

**Fig 7. Seeping calcite forms small stalactites in the canal roof and flow-stone speleothems.**

New routes and wider canals and tunnels were constructed up to the 1850s even at a time when the demise of canals was inevitable.

The railways came in gradually from the 1820s and started to take over, using the strong iron that industry was producing. For a while tracks were built next to the canals but in the 1840s canals saw a continuing slow decline.

**Canal construction at Castle Mill Basin 1810 (artists impression)**

### Future restoration?

The Dudley Tunnel remained in operation for over 170 years until it was closed in 1962. The quarries and caverns linked by subterranean canal tunnels, are unique, and restoration and promotion of the geology and industrial heritage is unlikely to stop after the huge successes achieved over the years. This not least driven by expertise, enthusiasm, learning and tourism that captures the public fascination and pride. The Dark Cavern, where Murchison lectured to thousands of Victorians, remains too dangerous to visit, although there are hopes of changing that. It is Britain's largest man-made limestone cavern. **If there is an opportunity to visit the Black Country on another geology field trip, take it!**

### *Noel Donnelly* writes about the trip to Geosite 12 Bumble Hole and Warrens Hall LNR

The last location of the day on Saturday drew together Graham's theme of how the underlying geology affected landscape evolution and how this then influenced the industrialisation in the area in the late 18th and 19th centuries. Bumble Hole/Windmill End is focused on Dudley No. 2 canal, built in the 1790s, that ran from Dudley Tunnel (morning visit) along the side of the Rowley Hills ridge to join the Worcester and Birmingham canal near Selly Oak.

(this route via another tortuous and often closed tunnel). The whole Dudley Canal provided a transport route south to the Severn or north to Staffordshire and opened up the area to industrial exploitation by providing transport for the coal, clay and the iron works. Traffic boomed and the link northwards through Dudley tunnel became very congested so a new tunnel, branching off the Dudley Canal, of double width with towpaths and gas lighting was built in the 1850s. This was driven under the ridge of dolerite (seen in the morning) and was possible because it was found that the dolerite did not extend to depth but is a lopolith and the tunnel was cut through the Coal Measures underlying the dolerite.

The group at the engine house

The geology of the area was seen to be reflected in the current remains of a clay pit, now a nature reserve, in the Etruria Marl (from which the Staffordshire Blue engineering brick was produced). Further evidence was mine spoil tips and a preserved pumping engine house (similar to types seen in Cornwall), the course of mineral tramways and one standard gauge railway line.

It was only on my return when I looked at the 1890 Ordnance Survey map of the area that Graham’s description of the industrial activity became apparent - many, many small mines, iron works and brick pits all in close proximity. What a contrast to today, housing estates and green spaces!

*Val Fogarty* concludes the Black Country reports with an account of the trip to:

**Saltwells Nature Reserve**

1. Doulton's Clay pit

This was the last Geo Site we visited on Sunday 5th September with our leader Andy Harrison. The geology of this site includes three SSSIs and includes rare mining and industrial heritage features. Lady Dudley planted trees to hide the scars of coal mining in the 18th Century and mining ceased here in the 1940s. It includes a large clay pit, bell-pit mines, deeper, older mines and spoil heaps, an abandoned mineral tramway and an adjacent canal. It covers over 100 hectares and is one of the largest urban nature reserves in the country. In the exposed rock faces of Doulton Claypit we saw fireclays, ironstones and some evidence of coal interwoven with siltstones and sandstones which were formed in a hot, steamy swamp in the Carboniferous Period when the Black Country lay on the Equator.

The site shows two distinctly different periods of earth history, when very different conditions were present. The first and oldest rocks contain evidence of the change from ancient seabed to dry land. The second series of layers show how this land was covered by huge, swampy forests with trees growing up to 45m in height that created the coal seams. The oldest rocks exposed at the site are of Silurian age dating between 420 and 417 Ma. During this time an ancient, shallow, tropical sea was squeezed by earth movements and slowly rose out of the waters to become dry land. Muddy shelly rocks exposed in the tramway section pass upwards into layers with more sand.

As these rocks are traced up layer by layer at canal section they change to a reddish colour. This indicates they were above water and iron minerals were exposed to the air. The remains of sea creatures can still be found in the tramway cutting.

2. Andy at the Canal Cutting

The rocks that succeed the Silurian strata are quite different. Most beds of Carboniferous age rock are seen at the canal side. Here, they are a series of pebbly and gritty sandstones with occasional flattened tree trunks. These layers formed in a fast flowing river channel. The next layers are seen in Doulton's Claypit, where they are typically grey in colour, muddy containing a coal seam and ironstone layers. At the end of these times great earth movements folded and faulted the landscape and hot molten magma forced its way into the cracks, cooling to form vertical intrusions that cut across the other rocks. This happened at c.307 Ma.

Mining of the 12m thick coal seam started in the 1600s. Most of this has now been removed and there was little evidence of any Coal Measures. We walked down into the vast clay pit and Andy pointed out the different geological features. In the south-east wall we saw a cyclic pattern of sandstone, mudstone, fireclay and coal seams. The sandstone was fine-grained and showed cross-bedding in different directions. Here was a braided fluvial system of water flowing over a low-lying, relatively flat landscape. A change then happened to lower energy conditions in deeper water when mudstone and a reddish-brown ironstone was deposited. Finally, in swampy conditions, trees fell into the water and fossilised in anaerobic conditions to produce coal. These were laid down as seams that the miners had different names for such as Benches, Floors, Lamb, Slipper, Sawyer, Roof etc. Mining of coal was dirty and dangerous and in 1865, 50 tonnes of a coalface collapsed killing 6 workmen. The ironstone contains about 35% iron which is poor quality and it was often left.

3. Dragonflies at Saltwells

Decaying animals or other organic matter acted as a nucleus, round which iron was precipitated. Huge, artificial dragon flies had been placed near pools to show how large these insects grew to in the Carboniferous Period.

4. Dolerite intrusion at Saltwells

In one area there is a huge deposit of salt which was extracted as brine for baths and medicinal treatments during the 1800s. That is the origin of the name Saltwells to the reserve. Analysis of the water found it to be an equal quality to that of Cheltenham Spa and Harrogate Spa. The Earl of Dudley considered creating a pipeline to carry the brine to Netherton to turn it into a Black Country Spa Town. The precise brine source is unknown but it was somewhere within the Silurian Shale rocks.

As we climbed out of the clay pit some of our party left to make their way home to Dorset but a few of us continued to see more. We saw evidence of the tramway which was used to export the materials dug out of the pit and take them to the canal to be transported and connected the Earl of Dudley's Estate with the Potteries and the rest of the Midlands. It was interesting to come across a metamorphic zone with intruded dolerite lying next to sandstone. Quite a lot of this thin dolerite zone has been removed. Andy showed us holes in the rocks which may be gas bubbles but no one is sure. Brewins Cutting was originally a tunnel and was excavated using dynamite in 1838 before being made into a cutting next to the canal in 1858.

5. Brewins Bridge, Saltwells

**6. DGAG members at Saltwells**.

On the south wall there is a sandy, olive-brown, purple and green mudstone, produced in estuarine conditions. Then it progresses to grey mudstones indicating a reduction in oxygen levels. The mudstones to the right are Devonian red Mudstones dated at 415 Ma.) and those to the left are Carboniferous Coal Measure mudstones (315Ma.) The basal conglomerate representing 100 Ma. is missing here so there is an unconformity between the Carboniferous and the Silurian/ Devonian. The tilting of 30° happened later on during the Variscan orogeny at the end of the Carboniferous Period. This closed the Rheic Ocean when Avalonia and Gondwana collided. This wall is one of the SSSI sites.

We made our way back to our cars and thanked Andy for another wonderful day. A few DGAG members went back to Dudley to spend their final night at the Travelodge and in the morning explored further geo-sites including the Wren's Nest.

*Anthony Brook* responds to: **More on the Wad Mines of Borrowdale, Cumbria**

It was with interest I read Pat Snelgrove's comprehensive article in the Autumn Newsletter. I choose for my third-year dissertation in 1980 to write on the '**Geology and origin of graphite deposits with special reference to the Seathwaite Graphite Deposit'**. I had been inspired by visiting the site a few years before and the account in E H Shackleton's Lakeland Geology and a pre-publication chapter on the Epigenetic Mineralisation of the Lake District by Ronald Firman (1929-2005) who wrote: *"Graphite nodules resulting from the incorporation of coal in volcanic rock are not uncommon but not in rocks as old as those at Seathwaite*. ***The Seathwaite deposits are therefore the only example in the world, known to the writer****, not associated with high grade regional metamorphism and demonstrably not due to thermal metamorphism of carbonaceous material"*

Before embarking on the topic, I had carried out an initial check of the literature and hoped that I would be able to show that the Seathwaite deposit was unique. Unfortunately, it transpired the Academic Journal Pat refers to Geochemica et Cosmochimica had been selectively translated 40 years ago and nearly all my references were unavailable in the English edition that our science library held. I had the opportunity a couple of years ago to acquire a large specimen from Ralph Sutcliffe. *(shown above)*

*Graham Smith* responds to **Alan Holiday's article on Abbotsbury**

I have read the article by Alan Holiday with some interest. I am a keen student of the railways around Weymouth and the mention of the Ironstone at Abbotsbury caused me to look again at the history of the Abbotsbury Railway from Upwey.

The ironstone deposit was a key factor in the proposal for the railway. In a meeting at The Kings Arms, Dorchester, 6th October 1877, Abbotsbury was prophesied to be "a mineral manufacturing district, no one could estimate the enormous amount of wealth that might be brought to the neighbourhood". The speaker then pointed out that the potential of the deposit matched that at "Middlesborough, where a small village was now, (1877) a town of 35,000".

Later, on the 28th November 1877, Mr Passmore Edwards, the chairman of the Abbotsbury Railway, suggested that there were “millions of tons of ore awaiting removal”.
Another speaker, Mr Anderson Hanson, suggested that Abbotsbury could develop similar to Bilbao in Spain, where between 700 and 1000 men were employed. At that meeting, the ore was said to contain between 27 and 30% iron, which was judged “good enough for anyone”.
Work started on the line on 8th April 1879, but the line did not actually open until 9th November 1885. By 1886 however, there was no mention of the iron ore deposits. Some stone, about 1500 tons in 1893, was quarried at Portesham. By the time that the line was taken over by the Great Western Railway in 1896, there “was no more talk of vast deposits of iron ore just for the taking”.
Some oil was subsequently exploited, particularly during the First World War, with German POW’s working the site at Corton, near Portesham.
Mr. Holiday refers to the iron workings being worked either in late Victorian or the early 20th century, it seems that the former is the likely date.

*Sheila Alderman* **pays tribute to Jane Clarke, deceased,** founder member of the Dorset Geologists Association Group and Honorary Member of The Open University Geological Society.

Jane Clarke and her husband Trevor

It is with sadness I am writing this obituary for Jane Clarke, who I have known since I joined the geology groups in 1995. Jane had Parkinson’s Disease for many years and passed away in hospital on 12th January 2022.
Jane studied Earth Sciences with the Open University in the early days and achieved a B.A. She was particularly interested in palaeontology and developed this by joining OUGS in 1986. She and her husband Trevor were extremely supportive to palaeontologist Steve Etches in helping him to write up papers and his autobiography and to make the successful bid for his fossil collection to become a public museum, The Etches Collection in Kimmeridge.
In 1993, there were plans to replenish the beach at Ringstead Bay with Tertiary gravels as a form of coastal defence. Jane joined with a few others to form the Dorset Geologists Association Group to oppose this. The Ringstead Bay SSSI was designated because of the unique Ringstead Waxy Clay and Ringstead Coral Bed. This was subsequently obscured by the coastal defence work. However, the DGAG went from strength to strength, thanks to the determination of its founder members.
Jane was also very actively involved in the Open University Geological Society. She was Branch Organiser of the Wessex Branch for a number of years until the mid-1990s and helped to organise several Symposia. She used to produce the Wessex Newsletter and went on to edit the National OUGS Journal from 1991 to 2007. Jane was active in OUGS national committee meetings and was very supportive to members. As a result of her excellent editorship of the Journal, Jane was awarded honorary membership on her retirement. She was extremely supportive to David Jones who subsequently became Journal Editor.

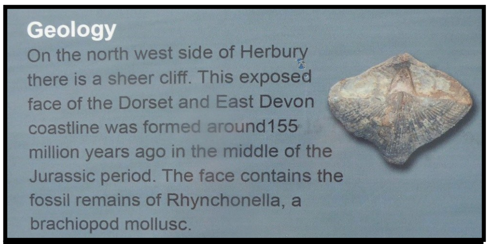
*Alan Holiday* **reports on October’s Fleet Field Trip**

We were extremely lucky with the weather when around 25 members of DGAG met at the Moonfleet Hotel. The field trip was led by Geoff Rowland and Andrew Lawrence, palaeontologist for the Moonfleet Hotel. Unfortunately, the tide was high in the Fleet and access to the beach sections was difficult. There were beautiful views in all directions with blue sky and blue waters of the Fleet. We walked along the coastal footpath from the Moonfleet Hotel north towards Langton Hive Point. We didn't look at the Forest Marble exposure by the hotel because the tide was too high and even on our return 3 hours later the situation wasn't much better.

**1. Forest Marble from Moonfleet Hotel beach**

The first stop was in Gore Cove where Geoff told us about the Forest Marble and its use for drystone walling. It is an important rock locally where it outcrops for example around Langton Herring but also around Bridport. Not only is it used for walling but also for paving and damp-proof courses, especially where it is a bioclastic limestone made of shell fragments which makes it impermeable. As the local Forest Marble is in relatively thin beds it is ideal for walling as in Picture 2.

**2. Dry stone wall at Gore Cove**




**3.Part of information board at Gore Cove**

At Gore Cove our attention was drawn to an information board with an error linked to the fossil illustration calling a brachiopod a mollusc but also it didn't look like a *Rhynchonella* to me! We continued on our way to Langton Hive Point to see the oyster lumachelle. On the way we had good views of Chesil Beach and the development of ‘canns’ on the Fleet side linked the storm events in 2014 when water poured through the beach and waves overtopping the beach displaced the crest landward by up to 10 metres. While we walked along, continuing on the origin of Chesil Beach, Andrew Lawrence suggested that the source of some of the pebbles were derived from waters off the Scilly Isles and over time longshore drift would transport them all up the Channel including those currently in Chesil Beach to south-east England. I had never heard this theory before and thought that Chesil Beach is basically a fossil feature and longshore drift from west to east along the Dorset coast is restricted by the harbour breakwaters at Lyme Regis and West Bay. This is why it is illegal to remove pebbles / cobbles from Chesil Beach. I would be interested if any readers of this report are aware of Andrew's theory.

**4. Exposure of the oyster bed at Langton Hive Point**

**5. *Praeexogyra* fragments near Gore Cove**

When we reached Langton Hive Point the tide was still very high and it was difficult to get to the oyster lumachelle unless you were wearing wellies! However, we could see the exposure of the Frome Clay with innumerable *Praeexogyra hebridica var.elongata.*

Borehole evidence has identified two oyster beds, and these occur extensively across south Dorset including in the Bridport area. On our return walk back to Herbury I noticed oyster debris in a recently ploughed field near Gore Cove.

**6. Some *Rhynchonella boueti* and bivalves from Herbury.**

The group had special permission to visit Herbury where the Boueti Bed is exposed on the northwest tip of the peninsula. The *Rhynchonella* are best collected weathered out on the beach rather than the low cliff. We again were less successful than we might have been due to the high tide. We also found some terebratulids. In the past I have been on field trips at Herbury and small regular echinoids have been found.

We continued on back to the Moonfleet Hotel and some of the group were shown examples of the Forest Marble which is exposed on the beach (see Picture 1). The rock is rich in fossil fragments with brachiopods, bivalves and crinoid ossicles. On one field trip, I found a crinoid calyx which I showed to some of the group (see Picture 7).
Grateful thanks to Geoff and Andrew for organising the trip and securing access to Herbury which is normally out of bounds!

**7.*Apiocrinus* calyx from the Forest Marble at Moonfleet.**

## THE HOT ROCK SLOT

### BUCHITES

Buchites are uncommon rocks formed by the localised melting of sedimentary or meta-sedimentary rocks at the contacts of shallow basic or ultrabasic intrusions or, more rarely, adjacent to burning subterranean coal seams. In these **pyrometamorphic** settings, the melts produced cool rapidly and are typically preserved as **glass**. The essential part that melting plays in their generation means that buchites combine features of both igneous and metamorphic rocks, though they are usually classified as metamorphic. As such, they belong to the **sanidinite facies**, characterised by extremely high temperatures and low pressures.

The rock types capable of forming buchites are those with melting temperatures lower than those of basic magmas, and include impure sandstones, siltstones, clay mudstones and their metamorphosed equivalents.

***Fig.1. Buchite xenolith in a dolerite sill, Killiemore, Loch Scridain, Mull. Note pale plagioclase reaction rim around the glassy xenolith core. Photo: G. Droop.***

In the field, perhaps the most obvious buchites are those occurring as **xenoliths** (e.g. Fig.1). These are pieces of wall rock broken off and incorporated into the basic magma as it moved along the conduit. When immersed in basic magma, a football-sized xenolith will heat up very rapidly and attain the same temperature as the magma within a few hours, despite the fact that some of the heat is absorbed by driving endothermic mineral-dehydration and melting reactions.

Glass is commonly the most abundant component of buchites and is usually greyish brown, purplish brown (Fig.1) or black in colour. Even at temperatures of 1000–1100ºC, most sedimentary rocks are not completely molten, so the glass typically contains abundant mineral grains. These can include partially resorbed relict sedimentary clasts of minerals such as quartz (Fig.2) and feldspar. Also commonly present are small, well-shaped crystals of refractory minerals that crystallised along with the melt during heating. In buchites derived from mudstones, the melts have compositions poorer in alumina than the bulk rocks, so the refractory minerals tend to be Al-rich. Such minerals include mullite ($Al_6Si_2O_{11}$ – Fig.3), spinel ($(Fe,Mg)Al_2O_4$ – Fig.4), corundum ($Al_2O_3$ - Fig.5) and cordierite ($(Fe,Mg)_2Al_4Si_5O_{18}$ – Fig.6).

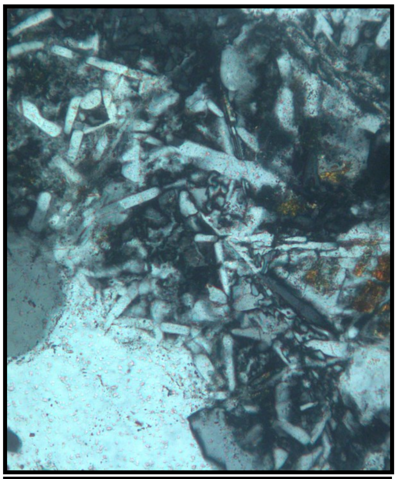


***Fig.2 Photomicrograph of quartz pseudomorphs after tridymite flanking relict quartz grains (lower left) in a psammite xenolith, Killiemore, Mull. Crossed polars. View 0.5mm across. Image: G. Droop.***

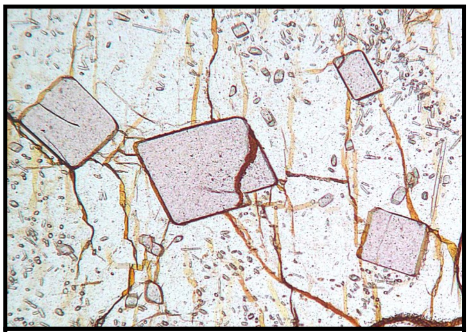


***Fig.3. Photomicrograph of mullite crystals in plagioclase. Rudh' a Chromain, Mull. Plane-polarised light. View 1.6mm across. Image: G. Droop.***

The colours of these minerals depend on the concentrations of trace elements present; with corundum, for example, small amounts of chromium give it a red colour, producing ruby, whilst a small amount of iron and titanium make it blue, producing sapphire (Fig.4).
Buchites derived from sandstones may contain tridymite ($SiO_2$ – a high-T polymorph of quartz) or else quartz pseudomorphs after tridymite (Fig.2), formed during cooling as the $SiO_2$ inverted back to quartz, its low-T form.

Buchite xenoliths derived from mudstones are commonly surrounded by **reaction rims** of plagioclase feldspar (Fig.2). These form by diffusive transport of Ca and Na from the basic magma into the melt of the xenolith where they combine with Al and Si to precipitate plagioclase. With prolonged interaction, these rims may grow to replace the buchite melt entirely, thus enclosing any refractory minerals present (as in Figs. 3 and 5).

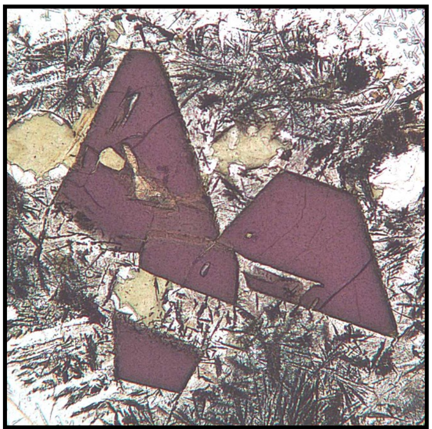


***Fig.4. Photomicrograph of spinel crystals in devitrified glass. Rudh' a Chromain, Mull. Plane-polarised light. View 1.3mm across. Image: G. Droop.***

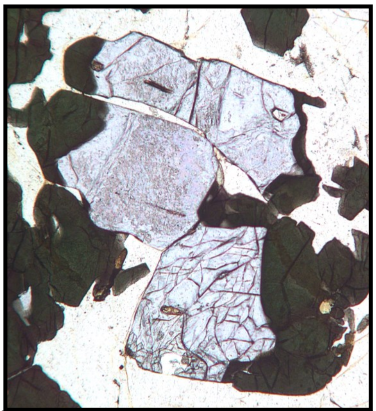


***Fig.5. Photomicrograph of sapphire crystals (pale blue) partially replaced by spinel (dark) in plagioclase. Rudh' a Chromain, Mull. Plane-polarised light. View 1.3mm across. Image: G. Droop.***

To my knowledge, the best place to see buchites in the UK is the Isle of Mull, Scotland, particularly in the vicinity of Loch Scridain where Tertiary dolerite sills contain abundant metasedimentary xenoliths, thought to be mainly from the Moine Series. The Rudh' a Chromain Sill (NM 524202) near Carsaig is the type locality of mullite. In N. Ireland, buchites derived from Devonian sandstone (Fig.6) occur at the contact of a Tertiary dolerite plug at Tieveragh near Cushendall.

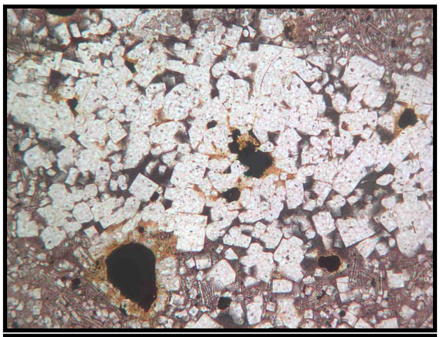


***Fig.6. Photomicrograph of cordierite crystals (colourless) and tiny mullite needles in brown glass. Cushendall, N. Ireland. Plane-polarised light. View 0.8mm across. Image: G. Droop.***

Man-made buchite analogues are much more common than their natural counterparts. The 'black hearts' of ordinary fired clay building bricks are a good match for the mudstone-derived buchites described above. Rarer are the partially melted rocks 'cementing' the stones in the walls of the so-called **vitrified forts** (Fig.7) of Scotland. These Iron-age and younger defensive structures have been the subject of much controversy amongst archaeologists, specifically over whether the vitrification of the walls was the result of fires lit by attackers or whether it was a deliberate strategy by the fort builders to strengthen the walls. *Giles Droop*

***Fig.7. Vesicular glassy rock 'cementing' stone blocks in a Pictish vitrified fort. Bing images.***

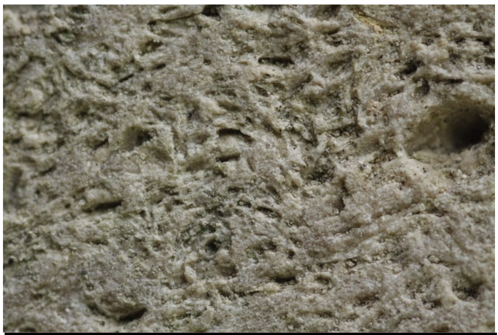
***Correction: The Winter Newsletter contained a splendid account of the Sherborne Quarries trip in August written by Simon Webster. I apologise for wrongly crediting the authorship to Simon Carpenter. At least I got it half right! Editor.***

## *John Scott* reports on: **A church of three stones**

**1. The Church of St. James, Kingston**

St James' Church, Kingston, near Corfe Castle is sometimes known as the 'cathedral of the Purbecks'. The church was built between 1873 and 1880 at a cost of £60,000 (approximately £7,404,000 now). The church was built of only three stones (there are now four!); these being Purbeck Marble, Burr and Pond Freestone. These were all sourced locally. The Marble and Burr were quarried near Blashenwell, between Kingston and Corfe Castle but the quarry is no longer visible. The Pond Freestone, a Portland Limestone, is from St, Aldhelm's Head quarry.

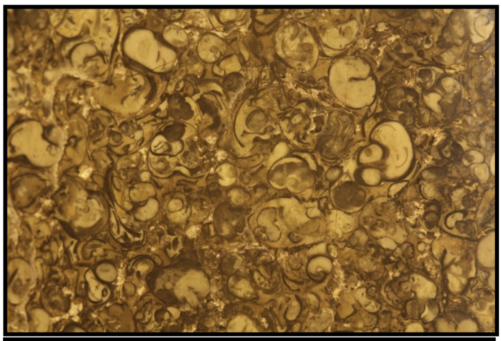
**2. Exterior algae**



**3. Burr**

The exterior of the church is totally constructed from Burr. It is of a pink colour due to the growth of algae on its surface. The interior is of Burr walls, with Purbeck Marble columns and details, and intricately carved Pond Freestone capitals The overall effect is outstanding. Some people do not like it, but everyone's' tastes are different.

**4. Pond Freestone**



**5. Purbeck Marble**

The fourth stone was not used in the construction but is of a natural occurrence. It is Flowstone (and stalactites) found in the entrance porch and a few other parts of the exterior. This is caused by the dissolution of the Burr limestone by acidic rain water and re-deposition upon the surface. Have a look at the church (donations towards the upkeep will be appreciated) but **do not touch the delicate stalactites**. The wrought ironwork is also notable.

**6.**

**7.**

**8.**

**6. All three stones as used.**

**7. The font**

**8. Pond Freestone capital with Purbeck Marble**

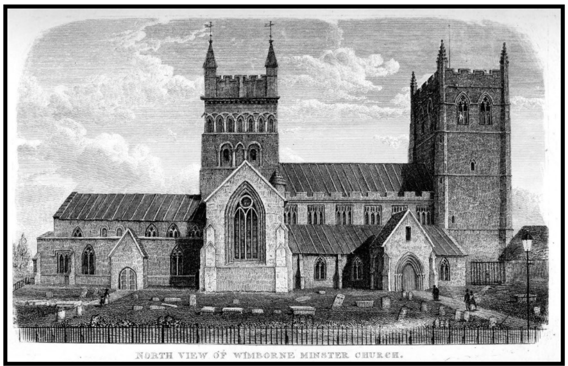
**9. Flowstone**

**10. Stalactite**

*Richard Barrett* **supplied this report on the:**

## Field Trip to Wimborne Minster 6th November 2021

Pete Bath was our leader for the day and we initially gathered inside the church, where we were given an introduction to the church and the afternoon ahead. The Minster is ideal for the study of its building stone because the stone is almost completely uncovered, without whitewash or medieval wall paintings. Most of the early work on stone identification was performed by Jo Thomas (see [1] for her book covering the county's building stones, highly recommended), and a leap forward was subsequently made with the involvement of the late Geoff Townson, who demonstrated the use of LED loupes and cameras (see Pete's article [2]). The relevant pages of the Dorset Building Stone website gives a detailed description of the exterior [3] and interior [4] building stone of The Minster, and were authored by Pete, Jo and Geoff.




**1.The northern aspect of the Minster in 1853**

**2. The Minster today**

We assembled along the path to the North Porch where we gazed up at the building that Nikolaus Pevsner described as "not beautiful", being built with "spotty brown and grey stone" [5]. An historical overview of the building of The Minster was given: originally founded in the eighth century as a Benedictine nunnery by Cuthberga, it was destroyed by the Danes in the 10thC. Edward the Confessor rebuilt and established the building as a church; it was subsequently repaired and extended by the Normans. The building has been further repaired and extended in subsequent years.

In all phases of repair and extension, whatever stone that was conveniently available was used or reused, and thus the building, which so irritated Pevsner, was seen to be an assemblage of stones of brown, green, grey and yellow, rough and smooth, and, we were to learn, from near and far.

The "spotty brown" stone is 'Heathstone' and this was the original stone used in the 8thC. building. Heathstone is a dark brown sandstone, deposited locally in the Eocene Epoch on the Chalk surface. It is widely found dispersed in small patches and loose on heathland and in clays, so normally available without need to be quarried from heathland. Iron within the sandstone cementation provides the colour. The round tower, visible on the north transept was constructed entirely of Heathstone by the Saxons, and encloses spiral stairs that we were to climb later.

The Central Tower was constructed by the Normans using Heathstone and limestone of Middle Jurassic age imported from the area around Caen, Normandy; the battlements are of 'Burr' – the Broken Shell Limestone Bed of the Upper Purbeck. It is interesting to note that it was the Dorset Building Stone group [3] who were the first to identify the use of imported limestone in the construction of The Minster. (The Norman tradition was to whitewash the exterior of castles and prestige buildings and so the texture of Minster stone was never intended to be revealed and from Early English times natural stone was considered most appropriate.)

We commenced our anti-clockwise tour of the exterior at the North Porch. We noted the columns either side of the doorway, constructed from Purbeck Marble – not a true 'marble', but a limestone from the top of the Upper Purbeck, that, when polished, exhibits a marble-like appearance.

Our attention was directed to one of the many clover leaf air vents just above ground level; this first one is carved in Wardour Lower/Main Building Stone (also known as Chilmark Stone), a freestone (finely-grained limestone) of the Portland Stone Formation, historically quarried at Chilmark. Amongst others such air vents around the outer walls Purbeck Portland and Middle Purbeck limestone have been used.

**3. Pete shows the use of Purbeck Burr (or maybe Quarr?) stone in a window of the north aisle, standing in front of a wall roughly built of Heathstone, Purbeck limestone and Upper Greensand. It is interesting to compare the standard of construction with that in the later photograph of the doorway in the North Chapel (Photo: RB)**

The walls of the North Aisle are built predominately in Heathstone and Purbeck limestone, with the occasional block of Upper Greensand, easily identifiable by its greenish colour (due to disseminated glauconite grains), together with the odd fossilised shell fragment and common trace burrows. This historic Greensand, from the Shaftesbury Formation, was quarried from below the modern town of Shaftesbury whilst today it is replaced by the somewhat later deposited Melbury Greensand now quarried a couple of miles further south.. The window frames in these walls use Purbeck Burr or Quarr (from the Isle of Wight). The two stones can be difficult to distinguish, both being limestones containing crushed shells. (‘Burr’ – Cretaceous - 146-140 Ma., ‘Quarr’ – Eocene/ Oligocene: 35-30 Ma. [3].)
The West Tower, built in the 15thC. specifically to hold The Minster’s bells, is largely of Upper Greensand with blocks of Wardour Lower/Main Building Stone used for repairs. Both stones may share the greenish colour due to disseminated glauconite and both can be identified by their distinctly black glauconite grains (green in thin section). Other repairs have been made with oolitic Portland Freestone – in addition to the pin-head small-grained ooliths, the white *Solenopora* algae – looking like “cous cous” said Geoff Townson. Turning the corner to the south side, we were shown the perhaps insensitive use of a block of yellowish Bath Stone in a greensand area repair. The sun-dial monument column, erected by the Victorians, is a smorgasbord of different stones with Ham Hill Stone, Portland Roach, Cherty Portland and one block of Norman French Limestone. The crest is made of original 15thC. Bath Stone and the three faces are a mix of Wardour Lower and replacement Bath Stone..
The south-west windows of the South Aisle are also in either Purbeck Burr or Quarr (with some Portland Stone repairs). Members of the group attempted to differentiate these with the aid of a LED loupe. As we moved past the South Porch, we could see blocks of limestone, in amongst the Heathstone, that have been identified as being imported from Normandy, France. Also, further east, looking rather out of place, is a block of polished Middle Purbeck limestone – most probably from the Thornback Bed.
The walls of the circular library staircase were built of Purbeck Burr by the Normans in the 15thC., as evidenced by the broken shells and crystalline calcite (sparite) cementation in the ashlar blocks.
The chancel, crypt and north chapel were rebuilt by the Victorians in a mixture of Purbeck Burr, other Purbeck limestones and Heathstone. The windows and door arches are in Portland Freestone. On this part of the tour we were met by the Rector – the Revd. Canon Andrew Rowland – who had spotted our group taking a very close interest in The Minster. Reassured, he checked that all our needs were being met. The warmth of The Minster’s interior welcomed us and we were given a presentation, with cut and polished samples available, of several modern building stones.

These included Pond (or Pon) Freestone, Wardour Lower/Main Building Stone and Shaftesbury Building Stone. Also on display was the sawn face of Sturminster Pisolite. The latter was used to illustrate the easily confused oolith and pisolith in orbicular textured limestones. We were asked to check out this texture in the nave arcade columns which have been used to distinguish the Norman French imported stone of the 12C. from any local or UK Bathonian limestones. A visit to the DBS website [4] was recommended for a full explanation given that time was short.

**4. Burr or Quarr? (Photo: RB)**

The Pond Freestone, from St. Aldhelm's Quarry, Purbeck is from the Portland Stone Formation (late Jurassic), which on close examination shows a fine non-oolitic grainstone structure. The Wardour Lower/ Main Building Stone (WL/MBS), from the Vale of Wardour (Chilmark) is of the same age as the Portland Stone Formation, but it a very well cemented sandstone sometimes showing a green colouration due to glauconite and a grain size below 0.5mm. The Shaftesbury Building Stone is a glauconitic sandstone of the Upper Greensand Formation (mid Cretaceous) and its identity can be distinguished by a grain size generally exceeding 0.5mm often accompanied with trace fossil burrows.

**5. Beautiful work by the Victorians: north chapel door frame in Portland Freestone, set in Purbeck limestones and Heathstone rough ashlar blocks (Photo: RB)**

Having examined the samples, the party was spilt into three groups and, separately, we explored the three circular staircases inside the Minster. The Saxon staircase of the North Transept – built in the 10thC.-11thC. - is still largely Heathstone, but some of the treads have been replaced with Purbeck Burr or other stone from Middle Purbeck. The Normans built the library staircase in the South Transept of Purbeck Burr in the 14thC. We were privileged to be able to explore the famous chained library. The third staircase in the West Tower – which provides access for campanologists – was built in perfect Norman design but using Shaftesbury Upper Greensand in the 15thC.

**6. Pete describes the specific features of some building stone (Photo: Meg Gledhill)**

We ran out of time to explore further the church interior, but not before Val Fogarty, our Field Trips Officer, expressed thanks to Pete for such an interesting trip, where his enthusiasm and knowledge were so evident. We also thanked the church wardens Christine and Anthony Oliver and Bruce Jensen for making the church available to us, and for helping to guide our wayward party around the interior.

In a few parting words, Pete mentioned that there was the possibility of producing a booklet, similar to that produced for Kingston Lacy by Pete and Kelvin, to help the public identify the stones of The Minster. He suggested that anyone interested in the Norman French stone should "just take a close look" at the nave columns – presumably LED loupe in hand, and referring to the first paragraph of the Wimborne Minster Interior page on the DBS website [4].

The study of the Minster's building stone is a fascinating mixture of architecture, geology and history and we were guided around the building by one whose knowledge of all three we were privileged to share.

**References**

[1] Jo Thomas: Dorset Stone (Dovecote Press, 2008)
[2] Pete Bath: Our Legacy from Geoff Townson (DGAG Newsletter - Spring 2021)
[3] www.dorsetbuildingstone.org/wimborne-minster-exterior-tour.html
[4] www.dorsetbuildingstone.org/wimborne-minster-interior.html
[5] John Newman and Nikolaus Pevsner: The Buildings of England: Dorset (Penguin, 1972)

Many thanks to Pete Bath for reviewing a draft of this report and suggesting numerous updates.

Fifteen attendees were lucky enough to be able to attend this heavily over-subscribed field trip. It is planned to run another at some time so it seems worthwhile to list a couple of suggestions for a repeat performance:-
**Parking:** make sure that you buy enough parking for the trip duration. Our trip was billed to start at 2:15 PM and finish at 5 PM; I arrived at 13:45 and easily found a space. The cost was £3 for 4x hours parking in the King Street Car Park – the closest to The Minster.
**LED Loupes:** LED loupes are highly recommended for this trip and you'll get much more out of it if you have one to hand. Perhaps try borrowing if you don't already own one. See Pete's note in [2]

## Powys to Portishead Part Two by *Roy Musgrove*

Returning from Portishead to Powys across the Lower Devonian ORS and past the Usk Inlier, I took in the view from my house, which looks across the Usk Valley to Mynydd Llangattock. This forms the eastern end of the North Crop of the South Wales Coalfield. It includes the uppermost Devonian and Lower Limestone Shales and a great deal of earlier and later sediments. Whilst the lithology is broadly similar to what is seen at Portishead, there are also some considerable differences.

1. Panorama from Roy's house

The viewpoint is at about 190 metres and the opposite wall of the valley rises from about 60 metres at river level to 450 metres on the observed skyline. The base of the Lower Limestone Shales is at about 350 metres. The quarries in the main limestone were created in the early nineteenth century by Crawshay Bailey to supply flux for his Nant-y-Glo Ironworks in the Ebbw Valley and a tram road was built round the contour at about 350 metres to transport it, which is now a narrow tarmac road some five or six miles long to Brynmawr.
To the left of the view, the gorge of the Clydach River is concealed by the slope, with the Blorenge beyond, where the coalfield edge turns from east/west to north/south. Just beyond the right of the picture the now-closed Blaenonneu Quarry marks a point where there are considerable lateral changes of facies at several points in the sequence. This may be due to the influence of the Vale of Neath Disturbance, a very long and fairly old fault line.
The lowest rocks, forming much of the scarp, are known here as the Senni Beds and Brownstones. These belong to the Emsian stage of the Devonian and are equivalent to the Black Nore Sandstone of Clevedon. Further west they form nearly all the highest mountains of the Brecon Beacons rising to over 850 metres on Pen-y-Fan. Their summits, familiar from all sorts of pictures, show the flat, gently-dipping tops capped by the Plateau Beds Formation. This hard sandstone does not occur at the eastern end of the outcrop, nor at Portishead, so there exists an unconformity at this point in the sequence. The formation is of Frasnian age. The Portishead sandstones are traced further north up to the Forest of Dean. where they are equated to the Tintern Sandstone.

In the Forest, Tintern Sandstone is underlain by the Quartz Conglomerate Group, and it is this which forms the top of the Devonian on the north crop between Blaen Onneu and Pontypool. There are therefore unconformities at both Portishead and Powys, represented by the other's formation. The Quartz Conglomerate Group is of the Frasnian to Fammenian age and the Tintern Sandstone of Fammenian age. The Quartz Conglomerate Group is divided into three formations. Wern Watkin Formation has its type locality in my view and is the lowest.

**2. The Wern Watkin Formation at Wern Watkin Quarry, Llangattock Hillside (type locality)**

It is succeeded by the Craig-y-Cwm and Garn Gofen Formations which outcrop best on The Blorenge and in the Clydach Gorge. The Wern Watkin formation was deposited on an eroded Brownstone surface and locally off the right side of the panorama has a fish-bearing basal conglomerate, which may perhaps equate to the Woodhill Fish Bed at Portishead. It is about 3 metres of fine-grained buff/grey pebbly sandstones with occasional mudstone interbeds and terminates in a calcrete. The Craig-y-Cwm Formation also begins with a basal conglomerate of quartz pebbles which reappear upwards between pebbly sandstones and red mudstone interbeds for around 8 metres. The break between it and the Garn-Gofen Formation above is marked by an erosion surface overlain by a micaceous sandstone of yellowy white colour. It comprises up to 20 metres of grey/green sandstones and further red mudstones. The lower sandstones are quartzitic, but become soft, friable and rich in mica, garnet and feldspar further up the sequence. This material leads the Sheet Memoir to suggest that they originated from a metamorphic source. No research has been done to see if these too are Mona complex types, as far as I am aware.

The presence of these materials and of the Mona Complex constituents at Portishead led me to further consideration of how they got there. The Mona Complex of Anglesey consists of very old rocks which were subjected during Precambrian times to an orogeny more intense than the Caledonian or Hercynian orogenies. The changes resulting from extreme temperature and pressure produced distinctive metamorphic and intrusive rocks. It is possible that these were eroded into a bed, perhaps in the Welsh geosyncline, which was then overlain by later deposits. When the Wales-Brabant High was raised in late Silurian and Devonian times these overlying beds were eroded away and the "Mona bed" was exhumed and re-eroded from the Wales-Brabant High during the late Devonian. There is presently no evidence whatever as to how these components became embedded in Fammenian age rocks, but this theory does cope with both the geography and the extended timescale involved and would show that recycling is nothing new! You have to make up your own mind on the basis of probability.

Somewhere in the Quartzite Conglomerate Group lies the Devonian/Carboniferous boundary. The absence of the Tongwynlais Limestone north of Pontypool shows that despite the apparent transitional sequence there is an unconformity at this level. The level plane of strike and dip continues undisturbed, so no angular unconformity occurred. In passing, dip angles (to the south) rarely exceed 10º. As at Portishead, the lowest Carboniferous rocks are the Lower Limestone Shales.

**3.** ***The Castell Coch Limestone at its type locality, Castell Coch, Taffs Well***

On the North Crop these are unstained and they lack the Variscan ripple folds seen in Somerset. They are divided into the Castell Coch Limestone and the Cwmyniscoy Mudstone.

The limestones begin with a basal lag conglomerate with a thickness of a few tens of centimetres having a sharp boundary with the underlying Garn-Gofen Formation. It is followed by a series of calcareous sandstones and sandy limestones and cross-bedded, shelly, oolitic and crinoidal calcarenites. These in turn are followed by thin beds of shales, micrites and fine-grained limestones. A bed of oolitic calcarenite seen only as far north as The Blorenge has its top stained iron red, like the rocks at Portishead. At the base of the Limestones proper is the Sychnant Dolomite, occupying a comparable position in the geological column to the Blackrock Dolomite south of Portishead.

The North Crop is capped by upper Namurian rocks and Quaternary bogs, with Coal Measures just fingering up the lower southern dip slopes.

In summary, the Upper Devonian rocks consist of similar sediments and distinctive features in both places, but in somewhat different lithological form. The Lower Limestone Shales are more restricted in outcrop at Portishead but the composition differences are greater, possibly reflecting differences of position relative to the marine transgressions. The impact of the Variscan Orogeny was markedly different at the two places, with small scale folding at Portishead and one massive crumple on a regional scale in the South Wales Syncline. The reason for the differences are two-fold. Small flexures of the Wales-Brabant High will have caused local variation of slope and drainage during deposition. The Usk Anticline may have had some similar effect, but was primarily responsible for “buffering” the effects of the Variscan Orogeny. This uplift along a north/ south axis began in the middle Devonian and was particularly active again from late Dinantian to early Namurian times. In the middle Namurian it even hosted volcanic activity, possibly repeating earlier Devonian volcanism, demonstrated by the suggestion of volcanic dust in the Dinantian limestones and thin bentonite clays in Lower Silurian of the Usk Inlier.

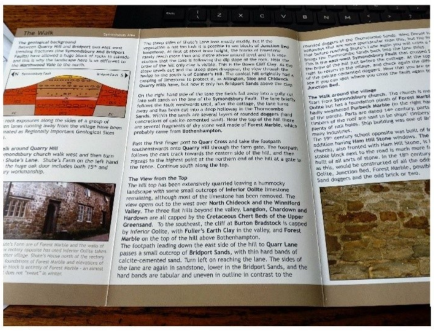
## Field Trip Officer *Richard Hallett* outlines the Field Activities for 2022

### Geowalks

This year we are introducing a number of Geowalks, one each month on alternate Thursdays and Saturdays. The Saturday walks are over 8km and the Thursday walks are less than 8km, with strenuous climbing in parts. These are a **walk first and foremost** - not geology field trips, there is even no need to bring a hand lens or notebook(!) but a stout pair of walking shoes/boots are required.

Countryside walks to explore the rocks that form the landscape of West Dorset and Purbeck.

DIGS, Dorset's Important Geological Sites Group, have published two attractive packs of self-guided leaflets to allow you to explore Dorset's geological and stone heritage.



It's an opportunity to get outside, socialise and exercise and (re-) discover some geology along the way.

The walks are based on those compiled and published by Dorset's Important Geological / Geomorphological Sites Group (DIGS).

The walks are detailed in the '*Beneath Your Feet'* leaflets and available for purchase in advance from Alan Holiday or on the day. There are five walking leaflets in each pack, with information and geological points of interest along the route.

**Time**: 10.15am ready to start the walk at 10.30am

**Format**: Start as a group – finish as a group, bring lunch and fluids.

**Leader**: Richard Hallett

**Limit**: 15 walkers, no minimum!.

**Register**: Email richard.rh.hallett@outlook.com

**Fee**: £2 (on the day)

*Continued on Page 19*

**Attendance**: Open to non-members although members will be given priority.
Walk 1. Thursday 3rd March. West Dorset. Symondsbury Area (5.5km)

Walk 2. Saturday 2nd April. Purbeck. The Chalk Ridge: Corfe Castle to Ridgeway Hill (9km)

Walk 3. Thursday 5th May. Purbeck. Acton-Langton Matravers-Dancing Ledge (6.5km)

Walk 4. Saturday 18th June. West Dorset. Abbotsbury Area (10km)

Walk 5. Thursday 7th July. West Dorset. Golden Cap & Hardown Hill (7km)

Walk 6. Saturday 6th August. West Dorset. Hardy Monument-Portesham Farm-Corton (8km)

Walk 7. Thursday 1st September. West Dorset. Burton Bradstock-Wanderwell (8km)

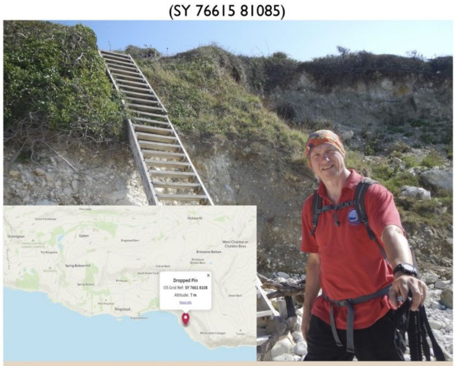
Walk 8. Saturday 6th October. Purbeck. Agglestone-Studland-Ballard Down (11km)

Walk 9. Saturday 5th November. Purbeck. The Chalk Ridge: Corfe Castle to Ulwell (13km)

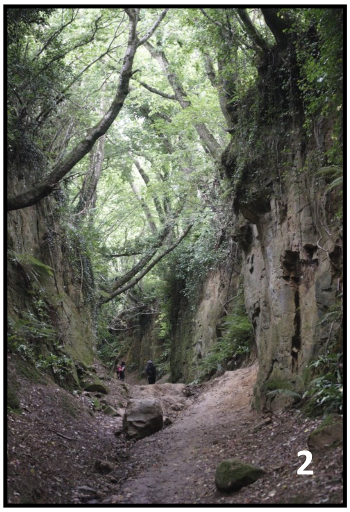
**Day Field Meetings (see next page) Field Leaders:** If any members would like to have a chat about leading or co-leading a field meeting please contact Richard. Thank you.

*Richard* also provides the answer to Where is it? No.1 and sets us another challenge in No.2

The start of the walk from Ringstead Beach to ascend White Nothe via the ZigZag path, a steep and exposed path to access the Zig Zag Chalk Formation to the Lewes Nodular Chalk Formation (SY 76615 81085)




"The shepherds call it the Zigzag, and even sheep lose their footing on it; and of men I never heard but one had climbed it, and that was lander Jordan, when the Excise was on his heels, half a century back. But he that tries it stakes all on head and foot, and a wounded bird like thee may not dare that flight"
Moonfleet, J. Meade Falkner 1898




The first publication by the Dorset Building Stone Group, authored by Pete Bath **"The Beauty of Kingston Lacy Stone"** is now available, price £6 plus £2 P&P. Orders can be placed with me (Kelvin) or by email at: dorsetbs.publications@gmail.com

https://dorsetbuildingstone.org

## DGAG Winter Workshop December 2021

Over 30 members attended the workshop. We enjoyed seeing a wide range of displays and a very nice buffet lunch mid-way through. It was a really enjoyable social occasion and for many, an opportunity to socialise and chat face-to-face for the first time in quite a while! Thanks to Alan Holiday for these pictures.

Thanks also to everyone who came and helped the event run smoothly. This is the last event organised by me so good luck to Chris Webb, who is taking over. *Kelvin*

## DGAG Field Trips and allied events 2022

***N.B. All events and field trips are subject to current Covid rules and restrictions***

**For the monthly GeoWalks see page 19**

### Field Trips

**Saturday 14th May.** Corallian Group - Ringstead Bay/ Osmington Mills led by Richard Hallett.
**Sunday 17th July** (afternoon). Kimmeridge Clay Formation - Kimmeridge Bay led by Richard Hallett unless an alternative leader is willing and available. Please mention if you are willing to lead when registering.
**Limit**: 15 participants.
**Register**: Email richard.rh.hallett@outlook.com
**Fee**: £2 (on the day).
Meeting time, location and information will be forwarded upon registration.

### Lectures

**Chris Webb is organising a monthly series of lectures at the Dorset Museum at 7 p.m.**
**24th February:** The Geological Structural Evolution of the Jurassic Coast World Heritage Site: Vincent Sheppard
**24th March:** Mars Rovers Exploration imagery and interpretations: Chris Webb
Contact Chris Webb for further details and booking as places are limited.

**Weekend Field Meeting** (date for the diary)

The weekend residential field meeting this year is scheduled for **Friday 9th to Sunday 11th September**. We shall visit the North Somerset coast and be led by John Scott. The locations will include Kilve, Watchet, Blue Anchor and possibly Lilstock. Minehead will be a suitable accommodation centre. Register an expression of interest to attend with Richard Hallett. Details to follow.

**DIGS (Dorset's Important Geological Sites)**
The group welcomes anyone wishing to help with conservation work on Local Geological Sites. Please contact Alan Holiday if you are interested. Working parties go out on both weekdays and weekends. **https://dorsetrigs.org/**
alanholiday@btinternet.com

**Wessex OUGS events**

Fieldtrips: Please contact Tom Mintern-Fountain on: wessexdaytrips@ougs.org to book a place.
£2.50 day trip charge.
**March 19th 2022: Geology of Osmington Mills** with Fiona Hyden
**March 20th 2022: Geology of Lulworth Cove** with Fiona Hyden
**April 10th 2022: Geology and Archaeology of Fyfield Area** with Dick Millard

**Can we help answer your geological questions?**
Either post them on our website's contact form or send them, maybe including photos, to me at the email below.
*Kelvin*

**Reminders:** Contributors' deadline for the Spring Newsletter is: **Monday, 30th May, 2022.**
**Committee news:**
We need a Chairperson and someone to handle Sales. *Kelvin*

| **DGAG Committee Members** | | | |
|---|---|---|---|
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