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Gift Aid – again!

I feel almost apologetic for having to raise again with members the subject of Gift Aid. However, it is an important source of income for us and so when there are changes in the national arrangements we have to respond to them. And I'm afraid that HMRC have recently introduced another change. Basically they are now no longer prepared to accept some of the older forms of words the people have been using on Gift Aid declarations. In particular they have objected to any form of wording does not explicitly exclude the fact that you cannot claim Gift Aid on tax payments – income tax, VAT, or council tax for example. Now the section never has made such a claim, it simply doesn't come within the scope of the payments that members make on which we claim Gift Aid. Nevertheless, because our specific wording does not exclude this, then we have to make a change. But I'm afraid it's not a simple as changing the wording for the future. HMRC are not prepared to accept claims made with wording that is unsatisfactory signed after 2012.

So your Committee was faced with the situation having to ask everyone who had signed a Gift Aid declaration after 2012 to do it again using the new form of words. Whilst this might only involve a small number of you, it didn't prove that simple. A number of members are in the habit of signing a fresh Gift Aid declaration when they pay their annual subscription. This means that it is difficult to tell who has signed what declaration and when. So the only safe thing to do is to ask all tax-paying members if they are prepared to sign a new Gift Aid declaration. This will mean we are certain that we got the right wording and that everybody is properly covered. I know it's a pain, but would you be so kind as to fill in the declaration (a copy is enclosed with this *Charnia*) if applicable and return it to me or to the Secretary.

Thank you for your patience.

Roger Latham – Honorary Treasurer

COVER PICTURE: Parys Mountain, Ynys Môn

Headgear at this ancient copper mine, visited during this summer's annual weekend field excursion.

inexorably, and catastrophically. These forecasts are based on extensive use of huge computer models. But all these models (there are now more than 35 of them) have parted company from the temperatures actually recorded since 1990. In fact since early 1997 there has been no rise at all (using basic regression analysis of the satellite data collected by NASA) for 18 years and 8 months. Fully one third of the increase in CO2 concentration in the air since the start of the industrial revolution has occurred in the same period. There are many other glaring problems with the models.

Alarmists are in complete denial about this. They have no intention of 'abandoning a beautiful theory sunk by a single ugly fact', (which would be the approach of traditional science). Instead there is emphasis on an alleged '97% consensus of all scientists'; research by Sceptics has revealed this as being based on a sample of just 79 people! I could add many illustrations of the same type, but space limitations lead me to simply recommend a wonderful recent book - 'Climate Change the Facts', edited by Alan Moran, published by Stockade Books, 2015. Two dozen fabulous essays – I especially liked the comment by Jo Nova that all the climate models forecast that a hotspot forms in the upper troposphere at tropical latitudes. Strange then that 28 million (yes, that's right, 28,000,000) weather balloons have failed to find any trace of this hot spot.

It's easy to ask why, for instance, the BGS hasn't been more active in questioning the basic science, especially not alerting the UK government about shale gas until about 2013. But they would have been shouting into an echo chamber. All recent UK Government Chief Scientists for instance have been Alarmists, repeatedly mouthing straight contradictions of multiple (hundreds even) of peer-reviewed papers questioning the UN line.

But that doesn't mean we, as geology enthusiasts, should give up, even if (as currently seems unlikely) the Paris Conference succeeds in cobbling together a coherent action plan. We've had a number of relevant talks here in Leicester in the last couple of years – on Fracking, the Thorium route to nuclear power, Stalagmites as climate temperature proxies, and the committee are looking to have more talks on the theme of 'geology meets climate science'. In the meantime we will find out half way through our winter programme whether mankind has acknowledged or ignored "the most important year ever".

2015 – Humanity's Most Important Year?

Tim Johnson

As we all know there is a global discussion going on about the implications of a warming world, and what we should be doing about it. For this article I will label those who forecast utter catastrophe unless temperatures are held down as *Alarmists*, and those who do not agree that that this view is adequately evidence-based as *Sceptics*. The former group is much larger, and has extensive support in the media, the political class, environmental lobbying groups and most academic scientists. Some of the more fervent amongst them have declared that 2015 is the most important in all human history. Why? Because in Paris this coming December, in the 21st of a series of huge conferences sponsored by the UN, delegates from some 200 countries (supported by some 50,000 Alarmist demonstrators) will agree an action plan to reverse the current warming. Or will they?

Sceptics, on the other hand, see this latest effort by the UN as, if successful, effectively the suicide note of Western civilisation. Certainly the advertised cost of any feasible programme will be absolutely enormous (but, to Alarmists, less than the cost of doing nothing).

So, a lot to play for. What has been, and what will/should be, Geology's role in all this? Well, that depends on what we mean by 'science'. The term has evolved a lot since the days of Bacon, Copernicus, Newton and the other pioneers. That early strand carries on to some extent today – Darwin, Faraday, Einstein, Dirac, even (via the invention of Hammerite paint) to the garage IT startups in California that launched our current PC and phone driven world. But after WW2 came the start of what is now known as 'post-normal' science. Eisenhower was the first to warn of the dangers of this new style of science, which has involved enormous teams of scientists, often in prestige or national defence work. A far cry from the individual scientist in his garret (or patent office): members of these teams have to have skills in cooperation (being 'good team players'), and easily become impervious to outside comment or criticism. A prominent exception is CERN, largely, I think, because it was set up to avoid any military work.

More recently has been the emergence of 'post-modern' science. This occurs when a topic is taken over by, in the main, non-scientists. In these cases the objectives of the group controlling the activity ("the project" as they like to say) assume over-riding importance, so that even scientific objectivity can be sacrificed. It is clear that we have reached this stage in the Global Warming / Climate Change argument.

Alarmists have for years been proclaiming that 'the science is in, now is the time for action'. The current scare began in 1970, when (the then very few) climate scientists noticed that Earth had stopped cooling, and was warming. Their message began to be noticed by politicians and environmentalists in about 1990, particularly after famous 1992 Rio conference, managed by Maurice Strong (who is credited as being the first 'global environmentalist). He and his successors have been open about their desire to 'usher in a new economic era'. Since 1990 there have been five huge reports produced by hundreds of experts nominated by 200 counties, all directed by a new UN committee (the Intergovernmental Panel on Climate Change (IPCC). These reports have forecast that unless CO2 emissions are cut rapidly to the 1990 level, global temperature will rise

EDITOR'S INTRODUCTION

The September edition of *Charnia* may not reach you until October this year - apologies from me and Committee - but the booked speaker for the first meeting of the 2015 - 16 series has had to cancel at short notice and we have been trying to find a substitute. You'll find the updated Winter Programme in the middle pages.

You can read about the good times had by all - maybe you were among them - on the summer field trips, organised again this year by Rob Tripp. His reminiscences of Anglesey, and the geology of four other superb locations, start on page 4.

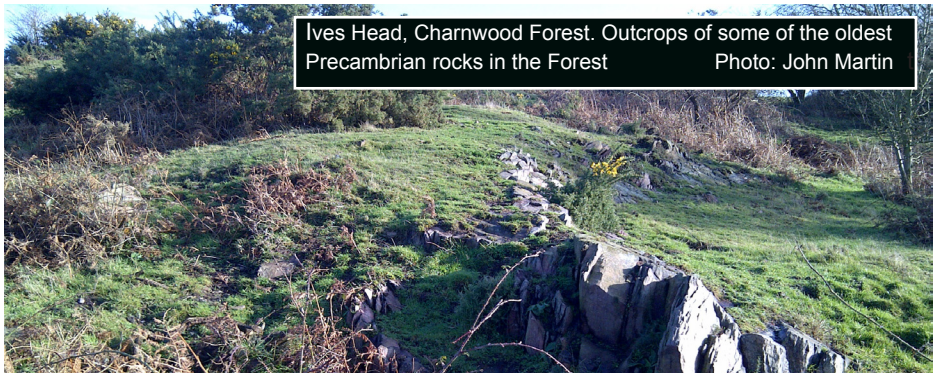
Helen Boynton, the doyenne of Leicestershire Precambrian palaeontology, summarises new discoveries in unexpected places, as reported recently by members of the Charnia Research Group, on page 3.

We have had several talks in the last couple of years on applied geology topics - fracking, nuclear power via thorium, stalagmites as recorders of past climates - that were perhaps a bit controversial, partly because they appeared to imply (to some in the audience, at least) that there really might be something slightly dodgy about the agenda-driven science of climate change. Tim Johnson, recent joiner of Committee, is sceptical about all this; many of you will disagree with his article on page 13. All I will say is that scepticism is vital for rigorous science ... and that being geologists does give us a healthy dose of that quality, as well as a longer historical perspective on climate change than what some (what Tim would call 'alarmist') climate scientists seem to recognise.

Don't forget, *Charnia* is your newsletter, and we welcome contributions from everyone.

Enjoy the coming winter programme!

John Martin, *Charnia* editor



Ives Head, Charnwood Forest. Outcrops of some of the oldest Precambrian rocks in the Forest Photo: John Martin

Exciting new finds in the Blackbrook Formation, Charnwood Forest

Helen Boynton

In the last issue of Charnia I wrote a short article about new fossils found in the Blackbrook Formation beds in Charnwood Forest. During the last few months Aron Bowers, Alan Cook and Dennis McVey have made exciting new finds at some locations which had originally been thought to be unfossiliferous – Blackbrook Reservoir, and Newhurst and Longcliffe quarries.

The (almost inaccessible) outcrop at Blackbrook Reservoir

At the southeastern end of Blackbrook reservoir, near where the Black Brook exits the reservoir, the Blackbrook Beds pass down into the Ives Head Formation in a steeply dipping section. Just above the South Quarry Breccia, Bowers, Cook and McVey found a *Pseudovendia*-like form, some discs and fronds (Bowers *pers com*). These finds suggest that the gap between the Ives Head Formation and the Blackbrook Formation may not be as great as 15 million years, as has previously been thought. A *Bradgatia*-like form was also found here, but not the *Ivesheadia*, *Shepshedia* and *Blackbrookia* forms typical of Ives Head itself. These last three genera might appear in these later beds one day!

At Newhurst and Longcliffe quarries, the Blackbrook Beds are steeply dipping and show anticlinal folding linked to the Abbotts Oak and Sileby faults. The two quarries are situated south of the Ashby to Loughborough road near Shepshed, and are separated by the M1. Newhurst quarry is an SSSI for its rare vanadium minerals (*pers com* Frank Ince). Precambrian fossils (discs) have been found here; and fossil trackways and other trace fossils (footprints assigned to *Cheirotherium*, mud cracks, rain prints) are present in the Triassic Mercia Mudstone. Longliffe quarry has yielded a new *Hiemalora*, worm trails, and *Aspidella*-like discs and fronds.

There are development plans for the two quarries: Newhurst is the proposed site of an Energy from Waste incinerator facility, while Longcliffe will be filled, partly with rock removed from Newhurst. They are not accessible without permission. Meanwhile, I wonder what will turn up there in future months, fossil-wise?

HB, September 2015

WINTER PROGRAMME TALK SUMMARIES

Wednesday November 18th

Dr Simon Drake (Birkbeck, University of London)

A re-appraisal of the volcanic evolution of the Isle of Skye, N.W Scotland; hot stuff, big bangs and meteorites!

Recently three new phases of Palaeogene silicic volcanism have been established on the Isle of Skye N.W Scotland. Their existence and nature radically change the accepted evolution of the islands Central Complex. We now know that whilst effusive fissure fed basic lavas volumetrically dominated early events, the entire volcanic episode entailed outpourings of silicic pyroclastic density currents that left some deposits similar in nature to those found in large N.W American province such as Snake River. Idaho.

A mantle plume which impinged on pre-existing continental crust is generally accepted as being the 'initiator' for volcanism on Skye and other parts of the British Palaeogene Igneous Province. We however suggest that the presence of shocked quartz and zircon at the base of the Skye volcanic pile indicates volcanism could have been initiated by an impactor.

Monday November 30th

Parent Body Lecture, *New Walk Museum*, Leicester

Tom Sharpe (Lyme Regis Museum & Cardiff University)

Mr Smith's remarkable maps

The production of William Smith's famous 1815 geological map, A Delineation of the Strata of England and Wales, with part of Scotland …, was far from straightforward. Encouraged by his friends in Bath, Benjamin Richardson (1758-1832) and Joseph Townsend (1739-1816), to publish his discoveries on the sequence of strata and their contained fossils, Smith issued a prospectus for a work on the strata of England and Wales in 1801. But John Debrett (1753-1822), who had agreed to publish it, was declared bankrupt and it was over ten years before the cartographer John Cary (1755-1835) offered to publish Smith's map. The map and its accompanying Memoir were eventually published in early September 1815, and its distribution began to the 410 subscribers listed in the Memoir. However, few had paid in advance, some refused to take their copies, and at least ten had died during the map's ten-year long gestation. Those who did purchase a copy were not all sold the same map; in addition to complaining to Cary about the variable quality of some of the colouring, Smith continually revised and altered the map, which must have been a source of irritation to Cary. Despite this, Cary continued to support Smith's publishing of his cross sections, reduced map of England and Wales, and county maps into the 1820s.

Although publication of the Geological Society's map in 1820 must have impacted upon the sales of Smith's map, sheets of the map were still being printed in the 1820s and several maps were produced in the late 1830s, just a few years before Smith's death in 1839.

hard limestone (e.g. Carboniferous) and soft (oolite, chalk). Here the calcium content is most important, and the high pH of surface water run-off. Carbonate ion seems to be unimportant. Orange and white-

grey lichens predominate on these rocks (Caloplaca, Xanthoria, Aspicilia). Magnesian limestone in Nottinghamshire, and as tombs in north Leicestershire has some unique lichens (Lecanora campestris ssp. dolomiticola).

Siliceous rocks include sandstones, mudstones, shales, schists, basalts, granites, etc. The lack of calcium may be the issue, giving low pH to the soil waters, for lichens here are seldom orange, but may be all colours: white, grey, brown, black, and many can be leafy, or bushy. Ultrabasic rocks are siliceous, with high calcium content, usually seen in dykes and intrusions. Here some highly specific, and rare, lichens can be found, usually Caloplaca spp.

Ultramafic rocks are also siliceous, but have magnesium that supports some very rare species.

Serpentines bear some unique lichens, presumably due to their magnesium content (Caloplaca aractina). There is, of course, a gradation between acidic sandstones and mudstones and basic limestones. Sometimes, sandy limestones can weather-out so much calcium, that they are treated as acidic sandstones by the lichens.

St. Andrews Church, Lyddington. Introduction to lichenlology from Tony Fletcher © Graham Cheeseman

Lichens are dependent on rain, or surface water, which bears the chemical signature of the rocks, or of the metals, over which it runs. Rocks that are subject to bird liming reflect the chemistry of the lime, and not the rock.

Space will not permit more to be plucked from Tonys' brief. It is a brief that has been studiously prepared, and for it, and the enthusiasm that he instilled in us, the thirteen of us are most grateful.

Rob Tripp and Tony Fletcher, September 2015

Summer Programme Reports

1. The Milldam Mine and Cavendish Mill Fluorspar Processing Plant, Great Hucklow, Derbyshire 19th May

I was browsing literature on the Carboniferous limestones of the Peak District, and found references to the old shafts that accessed the lead ore deposits on the Eyam Fault. In the old days, the gangue minerals were of no value, but when priorities changed, fluorspar became an important, valuable, raw material. The lifting arrangements in the old shafts then became inadequate. The adit at Milldam was driven, from just below the limestone/ shale contact, as a drift inclined at 1:8, to enable untracked access to the fault planes, from where the Hucklow Edge Vein System can now yield up to 150,000 tonnes pa of gangue minerals. Of this product, 45-50% is CaF_2 - fluorite, aka fluorspar; the remainder is composed of barytes - $BaSO_4$, with galena - PbS, and sphalerite - ZnS, as well as calcite and silica, as minor constituents.

Milldam Mine. Remote-controlled loader in a stope 100 metres high.
© British Fluorspar Ltd

During the past year British Fluorspar (a Fluorsid Group Company) has opened a lower level - Sub 2, below the one that we visited last year. We no longer needed to take a 2 Km ride, along the fault line towards Eyam, and back, for the new stoping is within comfortable walking distance of the Mine entrance. The present working is taking spar from the North Vein and the Great Hucklow Vein; and the working is most impressive. While not searching for the prize specimen, we watched in awe (no pun intended!), as a remote-controlled loader was used to stack ore, for loading, within a void of around 100 metres high, and 25 metres across. The stoping next along was being prepared for blasting later in the day. Progressively backfilling the stopings leaves no void greater than 20 metres high, so that support is provided to the host rock. When we exited the Mine, the Company very kindly offered to conduct us on a tour of the fluorspar processing facility at Cavendish Mill. It is there that the material from Milldam meets that from Tearsall quarry. Careful sampling ensures a uniform input to the processing plant, where the spar is crushed and screened, before being subjected to techniques to separate what becomes acid-grade fluorite, that is more than 97% CaF_2, from the by-products - barytes (famously used in drilling muds), and lead ore. The techniques used are such as washing with surfactants, aeration and froth flotation, thus separating the hydrophobic from the hydrophilic particles, gravity separation, and magnetic separation.

Our thanks to British Fluorspar Ltd for an excellent visit to the facilities at Great Hucklow and Cavendish Mill; to the Mine Manager, Robert Ridley; and to our guide in the Mill, Mine Engineer Harvey Allen.

Rob Tripp, September 2015

2. Annual Weekend Excursion: Ynys Môn, Anglesey, 19th - 21st June

There were thirteen of us on this superb weekend outing (after losing six booked particpants in quite sudden unforeseen cancellations. We were sorry for those upon whom ill-health took its toll). Professor Charlie Bendall and Angie again led us on this, the follow-up to last years' away-days in the Llŷn. Six Members opted to be under a hard roof in Beaumaris; while others chose canvas.

Fedw Uchaf is a good campsite. Four of us were aligned on perfectly flat, deep grassed

Section members with Prof. Charlie Bendall (and Sedgwick the dog) at South Beach, Traeth Lligwy. 'The disturbance', a presumed collapsed cave in basal Carboniferous Loggerheads limestone, is in the cliff behind.

ground. The ablutions were adequate, the showers free, and with a laundry/washup block. The pitches are numbered, each with an ehu if required, and the distance apart is good at about 3 metres - far enough to be not unduly harassed by Dennis' snoring. Three of the group were unable to use Fedw Uchaf (their tent was oversize); so they, and Charlie, Angie and dog Sedgwick (no dogs allowed), had to go to a campsite at Lligwy Bay. There are rules and conditions there, one of which is a 22.00 curfew. Our leader was shut out on Friday night…. we had met at the Bulkeley Hotel in Beaumaris for a social meal/drink. The staff, initially, had been reluctant to split the bill, and so we left in a rush to beat the curfew. Charlie found the gates locked at 22.00 by a time switch, so the owners claimed, and which they refused to over-ride. The Bulkeley Hotel also hosted us for our Saturday night dinner.

The first site was Traeth Lligwy. Down on the beach there is a patch of Irish Sea till, a deep red in colour. Its surface is crusted, with desiccation cracks, upon which the author stepped. The crust did not support his weight, and within, down to knee depth, it has consistency somewhat like gluey toothpaste. It's wet, and it stains… and it was, unfortunately, the first locality of the day…. The mishap has geological interest in that till, compacted by the thick ice above, loses its porosity, and this is never regained. In this instance, apparently, there must also be some smectite within the till: smectite reabsorbs fluid - in this case sea water - and gains the gel-like consistency, neither dispersed, as sand would be, nor solid, sticky/slippery, like clay.

had been sunk to accommodate the counter-weights, after a mishap in which the weights had fallen down the main shaft! Ron remembers losing a climbing ladder down that same shaft a few years ago!

For those of you who would like to see what you missed, you can browse the web pages at www.vmine.net/ecton2013/index.asp

We are much indebted, to Jill and Albert; on a fine summers' day, a most enjoyable time was had by us all, as well as educational enlightenment.

Rob Tripp, September 2015

4. Lea Quarry, Much Wenlock, Shropshire, Saturday, 8th August

Seventeen, keen, and excited, Members once again converged upon the Silurian limestones in the two quarries near Lea. It was another warm, sunny day - locals were swimming in the south quarry lake - and the fossils were soon leaping into our hands. We studied the Much Wenlock Limestones of c.425 Ma; the knoll reefs of the Edge, formed on the platforms of shallow lime-mud seas, in similar fashion to the Bahamas today, and were part of what is regarded as the greatest reef-building period on Earth. Our thanks go to Mike Allen again for gaining permissions, and for taking the time to produce papers that depicted those fossils pertinent to the locale, and which described the environment of the time. The north quarry had changed since our previous visit, two years before - some of us anticipated doom. However, that was not so… Although it has been graded, and the blocks removed, natural weathering, and winnowing, of the spoil, brought prizes to the surface. Trilobites were leaping to be caught.

And so it was after lunch, in the south quarry, those who had no luck before, were happy souls by the end of the day, with many trilobite fragments, beside the many other fossil types like corals, brachiopods, and gastropods. Mike was able to field the many questions put to him on the fly, and interesting discussions were held, before we retired to find the evenings' sustenance.

Rob Tripp, September 2015

5. Lyddington St Andrews Church, near Uppingham, Rutland, Saturday, 5th September

This excursion was a departure from the usual for Section C Members. We had billed it as a joint meet with the Natural History Section, but we were on our own on the day. Tony Fletcher led us through the graveyard, carefully inspecting, not the gravestones per se, but what grew upon them. The trained eye, on recognising the lichens that are growing on a stratum, can then deduce the chemical nature of the rock. The graveyard hosted limestones, sandstones, slates - both Welsh and Swithland - granite and marbles. The church wall provided lead runoff, and there were iron staples reinforcing cracked stones. I must refer to Tonys' brief, else I report with error.

Lichenologists are well aware of the lichen's specificity for particular rocks, but to a modern geologist their rock terminology can seem naïve. Use of terms 'basic' and 'acid' can seem confused to the geologist. What lichenologists mostly seem to mean is the pH content of water run-off rather than the actual rock chemistry. Calcareous rocks include

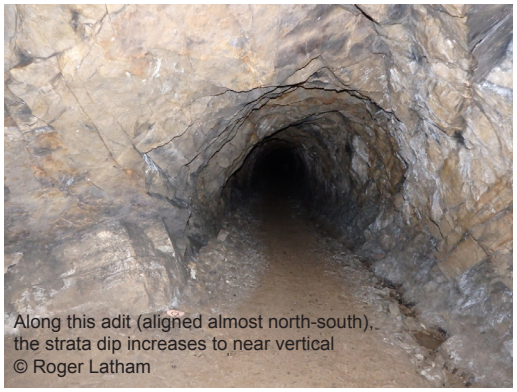
3. Ecton Copper Mine, Staffordshire, Saturday, 25th July

Members Jill & Albert Benghiat facilitated, and led, the Section visit into, and around, the Ecton Copper Mine, situated in the beautiful Manifold Valley of Staffordshire. Jill volunteers as Administrative Officer at the Ecton Mine Educational Trust (EMET), which looks after the fabric as it were, while Albert is associated with the Ecton Hill Field Studies Association (EHFSA), and mentors groups in tours and field work. We have them to thank for the opportunity to delve into part of the mine, taking advantage of their commitment there to allow the Section free access.

The exposure of the Ecton Limestone Formation strata, in the vicinity of the mine, by the road side, led to debate as to what had happened during the tectonic period that created such folding, especially as it appeared that compression may have been from more than one direction. Indeed, the mined copper ore body has been described as a saddle deposit, having being affected by the folding. The mine provided the wealth that the 5th Duke of Devonshire enjoyed, and which he invested, in part, in the architecture of Buxton. The fortunes of the mines on Ecton Hill had waxed and wained from before, or early in, the 17th century, until the large ore body was discovered in the mid-18th century. Ecton is the only known copper mineralisation in the Peak; the ore body was up to 50 metres wide, and the pipes were mined down to 550 metres, before the rich days ended around 1790. The ore had been as much as 60% copper, whereas 2% is common in current, global, deposits.

Ecton Mine is an underground SSSI. I have mentioned the depth of the workings, and you will realise that, without pumping, the lower levels would be under water.

We entered the mine through the education facility, at the Salt Level. This is an adit driven with the smallest gradient that allows any water to drain down to the entrance. Progressing inwards, the bedding planes of the Ecton Limestone are essentially horizontal. At the fault plane, which cuts across vertically, and almost at right angle to the adit, there is some small mineralisation. Beyond the fault, the character of the limestone changes; there are many chert bands, and the bedding dips markedly to the southeast (?). I suspect that we passed from Asbian/Brigantian Ecton Limestone to the Courceyan/Asbian Milldale Limestone. The adit ends at the main shaft that gave access, from the surface, to the deep levels, water can be seen glinting below, probably at river level. Outside, across the road, can be seen an adit that was driven to enable easier extraction of the ore, near to road level, and which now limits the depth of flooding. After lunch, al fresco, twelve Members climbed the Hill, visiting higher adits and shafts, seven of which can be seen at any one time. There is an illustrated walk, the area is very picturesque, and one of the points is the engine house, which held the earliest steam engine, replacing the horse gin, above the main shaft. Nearby is the 'beehive' which covers another shaft that

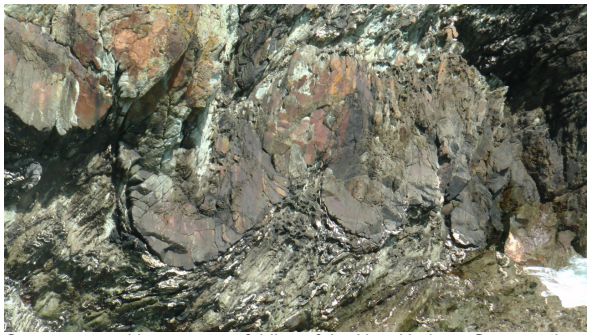


Along this adit (aligned almost north-south), the strata dip increases to near vertical
© Roger Latham

The till episode was on the way to look at the Devonian ORS strata on the north of the Bay, where we looked for way-up indicators (like desiccation cracks!), and the relationship between the folds and cleavage, to determine the location of the fold hinge. Then … across the fault to the south beach, looking at the conglomerate at the base of the Carboniferous; the limestones and sandstones, 'the Disturbance' (see photo above), a supposed collapsed cave in the cliff.

The afternoon was spent at Parys Mountain, the site of mines and quarries in rhyolitic/felsitic rocks, which yielded copper, and iron ochres. There, Charlie demonstrated, with a few chemicals, the acidity and conductivity of the standing waters, and explained the rôle of iron in the location. We finished at the stream, where the 'Old Ones' tried to precipitate the leached copper, by throwing in any old iron. The meeting of the waters, the confluence of the sough draining the Mountain with the Afon Goch, showed an instant chemical reaction, water plants thereafter being totally absent. A related story is that ships would anchor up in the Bay off Amlwch to allow the run off from the Mountain to kill the marine-fouling on their hulls. The old core pile nearby yielded a few mineralogical pieces of interest for some.

Day 2 started at Cemaes Bay, to look at the melange on the beach, and then to walk northeastwards, to appreciate the huge limestone clast, and to see the stromatolites. We then went to the micro-continent of South Stack; the plan was to have lunch there, so some rushed to photograph puffins, while others waited for those who were eating to finish, and then - there was insufficient time to look at the rocks! The price of £5.50 each to go down the lighthouse stairway, was also detrimental to progress (!), so we went to Rhoscolyn, and investigated the cleavage, faulting and crenulated/conjugated folding associated with the anticline, and the Rhoscolyn Formation overlain by the accretionary flysch of the New Harbour Group.



Competent and incompetent folding of the New Harbour Group at the cliff base of Rhoscolyn Head © Robert Tripp

After leaving there, six cars went south, to the glaucophane schists of the Ediacaran subduction zone; tail-end-charlie being Dennis. Two of us, naughtily, slipped away to scrounge some serpentinite - Mona Marble. When we arrived at the Marquis' Column, there was already an all-points-alert out for Dennis. After some time, he called in, as he had been unable to keep up with the others, and had gone back to the campsite. Jeremy had been #5; and had been torn between keeping the front cars in sight, and Dennis in his mirror. There we said our thanks, and goodbyes, to Charlie and Angie. some stayed on for another night(s drinking?), to go after graptolites near Lligwy Bay on Monday, while Mike was going to follow his nose, somewhere in North Wales.

WINTER PROGRAMME 2015 - 2016

All held at 7.30pm in *Lecture Theatre 3, Ken Edwards Building*, on the main University of Leicester campus, *except where stated*. Refreshments served from 7.00pm.
Details: Chairman Mark Evans, mark.evans@leicester.gov.uk, 0116 454 0231

2015

Wednesday October 7th
Prof. Mark Williams University of Leicester)
'Raiders of the last park', or, how humans came to dominate the biosphere

Wednesday October 21st
Lecture Theatre 1, Ken Edwards Building
Dr Sarah Gabbott (University of Leicester)
Title to be confirmed

Wednesday November 4th
Dr Monica Price (Oxford University Museum of Natural History)
Theme: the Corsi Collection of Decorative Stones

Wednesday November 18th
Dr Simon Drake (Birkbeck, University of London)
A re-appraisal of the volcanic evolution of the Isle of Skye, N.W Scotland; hot stuff, big bangs and meteorites! *

Monday November 30th
Parent Body Lecture, *New Walk Museum*, Leicester
Tom Sharpe (Lyme Regis Museum & Cardiff University)
Mr Smith's remarkable maps *

Wednesday December 2nd
Lecture Theatre 2, Ken Edwards Building
Dr Michael Simms (National Museums Northern Ireland)
From Here to Eternity: The extraordinary 4.5 billion year story of the Barwell meteorite

Wednesday December 16th
Christmas Meeting, *New Walk Museum*, Leicester

*** Summary on p.12**

2016

Wednesday January 13th
Dr Marc Reichow (University of Leicester).
Explosive super-eruptions: The story of the Yellowstone volcanic track

Wednesday January 27th
Dr. Albert Benghiat (Vice Chairman, Geology Section, LLPS)
Doctors and geology

Wednesday February 10th
Members' Evening, *New Walk Museum*, Leicester

Wednesday February 24th
Lecture Theatre 2, Ken Edwards Building
Dr Marcello Ruta (University of Lincoln)
Title to be confirmed

Saturday March 12th
Annual Saturday Seminar, University of Leicester
Planet of the Plants

Wednesday March 9th
Prof John Bridges (University of Leicester).
Exploring Mars

Wednesday March 23rd
Annual General Meeting
Chairman's address by Dr Mark Evans (New Walk Museum, Leicester)
The Mesozoic Marine Reptile Renaissance: Part 2