EXCURSION

Goodluck lead mine, Bonsall

28 June and 17 September 2019

Leader Paul Chandler

This evening underground visit was to an old Peak District lead mine on the south side of the Via Gellia, west of Bonsall in Derbyshire (SK 270565), which has been conserved by a dedicated group of mining history enthusiasts. Because of a limit on visitor numbers on account of the narrow mine passages, two trips were required in order to accommodate all of the members who booked for this visit.

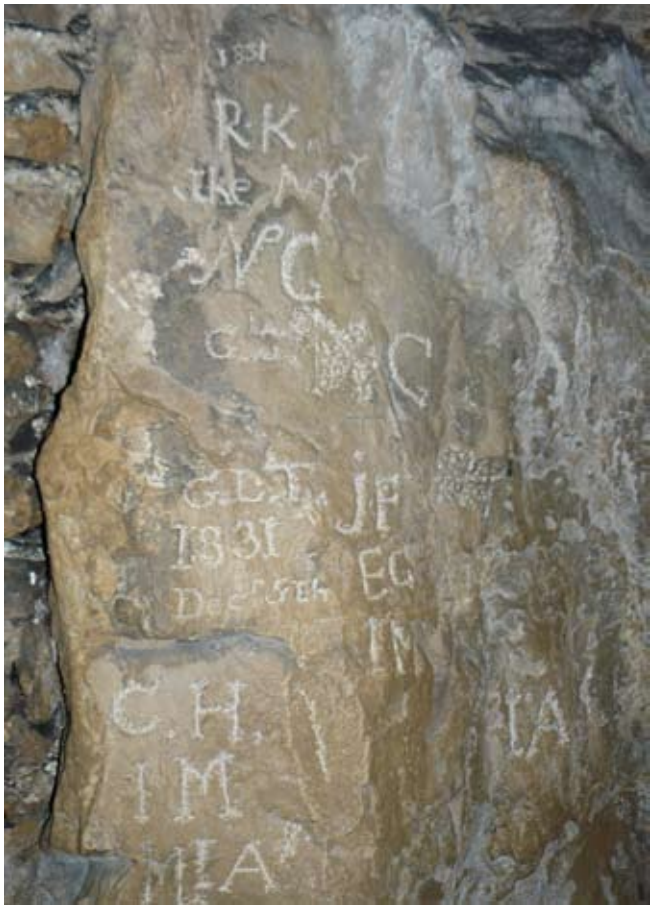
The mine is in horizontally-bedded massive limestones of the Visean Bee Low Limestone Formation. Its history is poorly known until 1830 when the adit was driven SE to intersect the NE-striking Goodluck vein (Anmer and Naylor, 1973). It remained a small and intermittently worked mine until the entrance was dynamited in the early 1950s. Twenty years later a group of mine enthusiasts, led by Ron Anmer, succeeded in removing tons of loose rock and soil to regain access to the mine. It is now operated by volunteers who take groups underground on a regular basis: http://www.goodluckmine.org.uk/.

Mine entrance

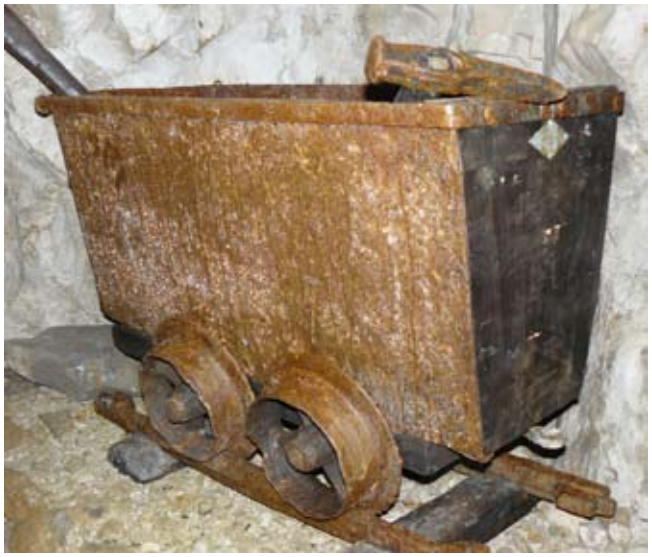
Our leader Paul Chandler and his fellow volunteers met each group at the coe (small building outside a mine entrance) and fitted us out with helmets and caplamps. Paul then led us along the narrow and winding adit, with a short and steep incline to meet the Goodluck vein which could be seen in the roof at certain points.

A tight squeeze

We were shown some of the mining tools that were used, including a jig for separating ore from waste, a mine tub for transporting ore along the level, and a kibble for hoisting it up a shaft. There was also a rock face inscribed with the initials of miners from December 1831. The narrow drives and occasional lack of headroom gave the party a real sense of the difficulties of working in such an environment. There were numerous very thin veins or scrins parallel to the main vein, which was mostly less than 30 cm wide but with multiple phases of mineralisation.



Miners' initials 1831



Two mining relics: a kibble (above) and a tub (below)

The visits concluded at around 9 pm. There was sufficient light for the June group to make their way down the steep hillside path to the roadside parking place, but the September group had to use torches to follow the path very carefully in pouring rain. Paul Chandler and colleagues were thanked for an interesting and informative visit.

Reference

Anmer, R. & Naylor, P. J. 1973. Goodluck Mine, Via Gellia. *Bulletin Peak District Mines History Society*, **5** (4), 217–240.

Tim Colman

EXCURSION

Anglesey

27–28 July 2019

Leader: Dr Ian G. Stimpson

Eight members and one visitor from the North Staffordshire Group of the Geologists' Association met with our leader, Dr Ian Stimpson of Keele University, in the car park of the Marquis of Anglesey's column at Llanfair PG (SH 533715). Ian used the GeoMôn display board and his excellent explanatory sketches to describe the overall geological history of the island. Anglesey has long presented a puzzle for geologists who have had to explain why its rocks and structure are so different from the rest of North Wales. It has been considered an 'exotic terrane' separated from the mainland by the complex Menai Straits Fault Zone.

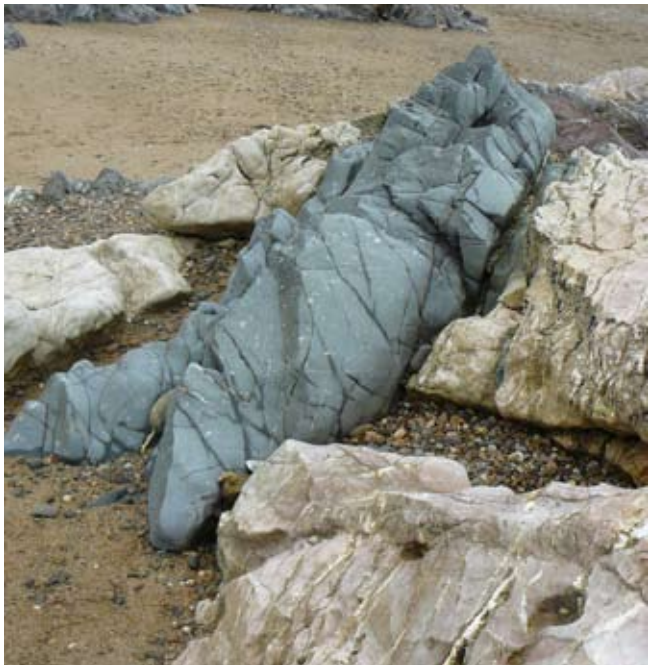
It is now thought that the earliest (late Precambrian) rocks originated as part of an active subduction zone on the edge of the Pannotia supercontinent at about 80°S latitude. The well-known and strongly folded 'blueschists' or glaucophane schists at the column's base were formed from basaltic pillow lavas 'scraped off' the oceanic crust as it descended. These were then subjected to high pressure–low temperature metamorphism during plate collision to form the glaucophane schists.

We examined strongly folded and metamorphosed blueschists around the base of the column which display very tight folding with flat-lying axial planes. Some pillow lava blocks enclosed in deformed schists were seen in the adjacent wood. Ian explained that it probably took 30 Ma from eruption of the basalt through its subduction and ascent to the surface again. The area of exposed rock around the column is a glacially eroded roche moutonnée formed by a SW-flowing ice sheet.

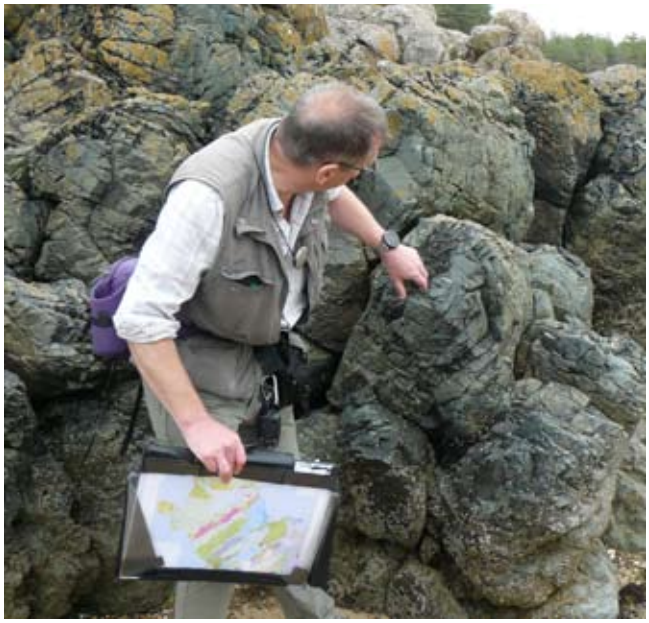
We then moved to Newborough Warren at the south-west tip of the island to see the famous Gwna Group Mélange (French for mixture) which was aptly

Freshy-exposed blueschist (as found) in wood below Marquis of Anglesey column (photo: David Bate)

named by Greenly who spent 25 years at the turn of the 19th century mapping the island and writing his monumental 800-page memoir (this year was the hundredth anniversary of its publication in 1919). The first stop was at an outcrop of rounded basalt pillow lavas, with individual pillows up to 1 m long, at Llanddwyn Island (SH 392636). We then moved on to the southern end of the island where Greenly found the original Gwna Group outcrop (SH 386625). Here multi-coloured mudstones and sandstones, with tuffs, jasper and limestones formed a chaotic mélange with rounded and angular clasts up to 50 cm across in a red mudstone and sandstone matrix (see front cover). A 2-m wide basalt dyke could be seen cutting the limestone.



Basalt dyke cutting dolomitic limestone in Gwna Melange, Llanddwyn Island, SW Anglesey (photo: Tim Colman)

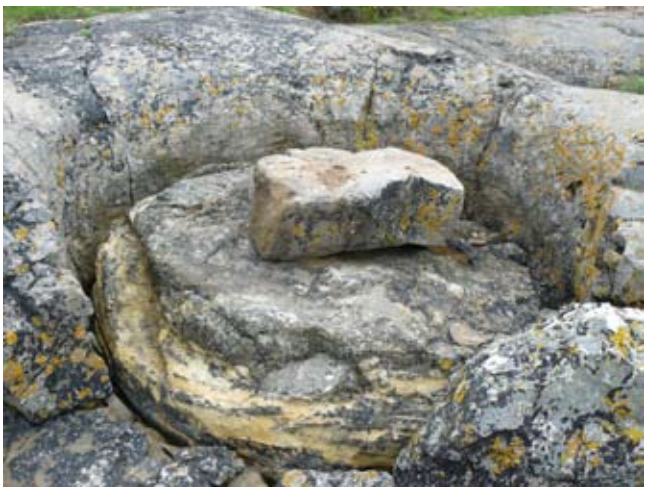


Dr Ian Stimpson describing pillowed basalt lavas, Llanddwyn Island, SW Anglesey (photo: Tim Colman)

The next locality was at Rhoscolyn where the party assembled at St Gwenfaen's church before walking across to the coastguard station (SH 263752). Here we examined the crest of the Rhoscolyn Anticline where beds of the Monian South Stack Group were well displayed with the Holyhead Quartzite formation between the South Stack Group and the overlying Rhoscolyn Formation. We then spent some time tracing some of the folding in the anticline with S-folds, folded quartz veins and schistocity in the mudstones implying a second phase of folding. The core of the anticline on a headland (SH 262751) showed 1st generation M-folds with axial planar cleavage and 2nd generation folded cleavage and quartz veins. The final locality of the day was to examine ledges opposite Maen-y-fran island (SH 259752) where excellent examples of 1st generation Z-folds with 2nd generation quartz veins were displayed in the South Stack Group.

Z fold in South Stack Group, Rhoscolyn (photo: Tim Colman)

The next day we met at the Red Wharf Bay car park on the north-east side of the island and walked 500 m north along the beach past Castell Mawr, a sea stack (SH 532816) in horizontally-bedded Carboniferous limestone and sandstone The thick-bedded limestone is heavily burrowed and bioturbated, indicating an emerging surface with a falling sea level. The underlying quartz arenite and siltstone showed low angle channel lags with several upward fining units. This pattern of deposition was caused by fluctuating sea levels as the Gondwana ice cap advanced and retreated. The limestone is covered by a marine terrace of Carboniferous limestone breccia cemented by calcite which may be Miocene in age.



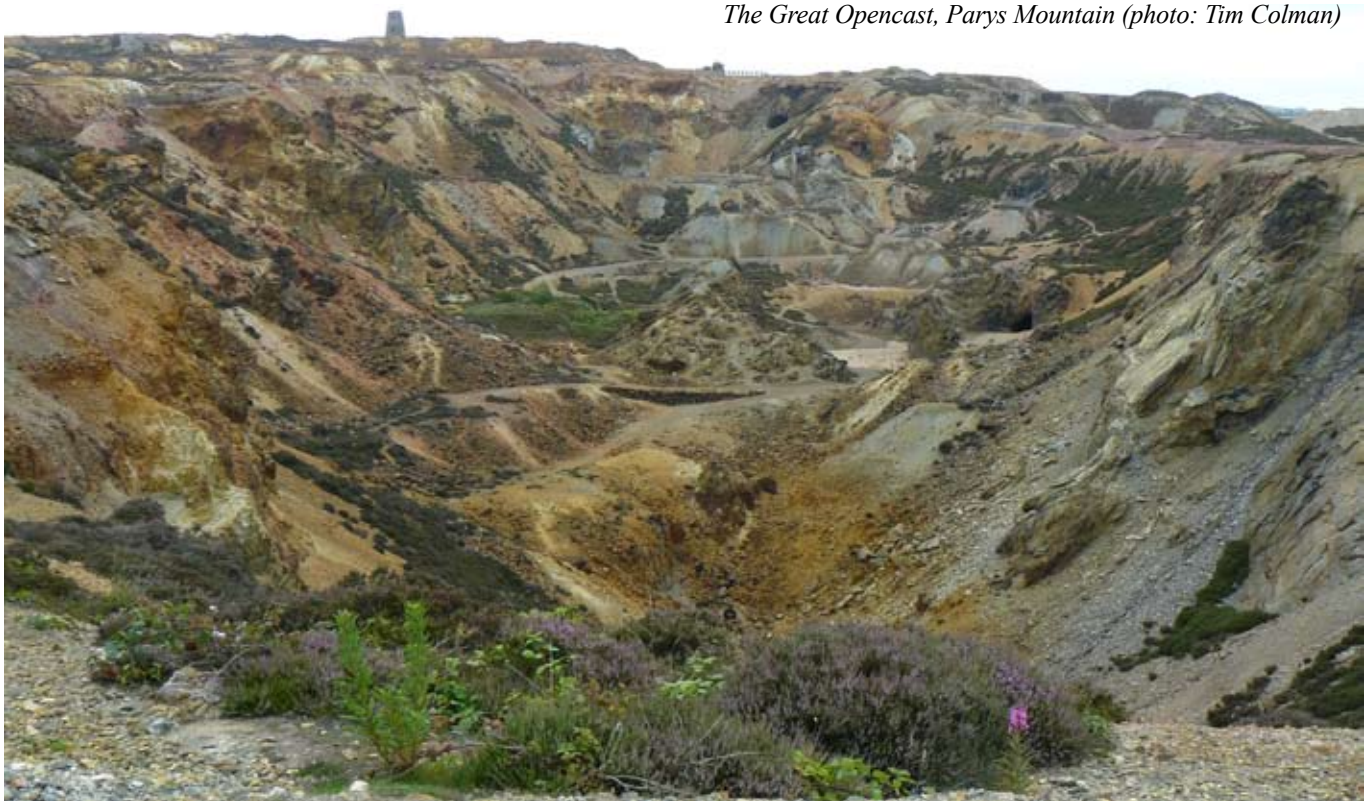
Limestone 'pothole' at Red Wharf Bay (photo: Tim Colman)

Just beyond this point along the beach a small cave in the cliffs showed a sandstone wedge extending down into the cave. There were also a number of curious rounded pits in the limestone bedding planes up to 2 m across and 50 cm deep with a core of sandstone. It appeared that sandstone pebbles in the karstified limestone surface had worn the rounded pits which were then filled with sandstone. A limestone platform (SH 532820) showed glacial striae and plucking indicating that the Irish Sea ice sheet was moving SW. The platform was overlain by red till, probably derived from Triassic rocks offshore.

We then moved up the coast to Lligwy Bay where we examined Devonian and Carboniferous sediments. On the south side of the bay we saw the basal Carboniferous conglomerate, with rounded cobbles of sandstone up to 50 cm across unconformably resting on red Devonian sandstones. We then moved to the north side of the bay to look at the well exposed Devonian succession. Ian explained that the area was at around 20°S and that there were few, if any, land plants. Rivers were braided, rather than branched as there were no plants to stabilise the banks. Large rivers were bringing sediment from the distant Caledonian mountains. The red Devonian sandstones and siltstones were strongly folded with minor thrusting and overturning of limbs, as at SH 49398781. Well-developed mudcracks indicated that some beds were the right way up. The outcrops showed excellent examples of channel sands with overbank silts which contained many carbonate desiccation nodules. The tectonism was probably due to the distant effects of the Acadian orogeny. Several prominent palaeomagnetic sample holes were visible — as they had been also in the pillow lavas at Newborough.

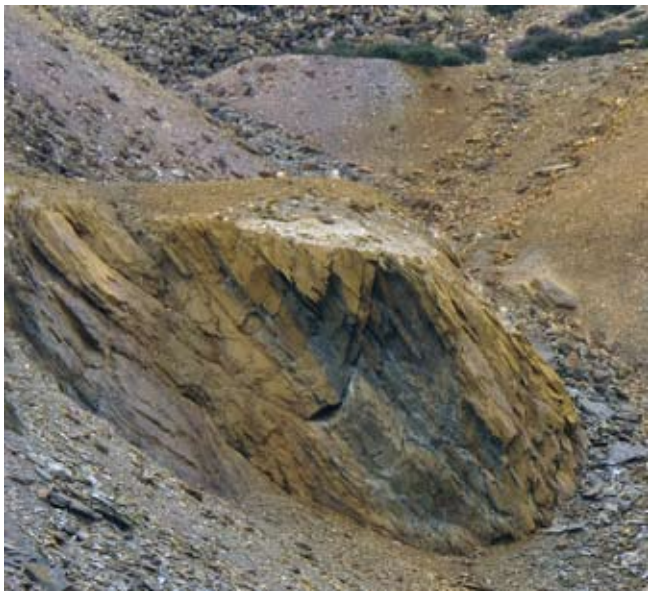
The final location was Parys Mountain mine with its amazing multicoloured Great Opencast. The operators, Anglesey Mining, who have been operating on this historic copper mine since 1986, have built a viewpoint and laid out a trail round both the open pits. There has only been sporadic activity, mainly additional drilling, since sinking the 300 m deep Morris Shaft and carrying out over 1 km of underground development in 1990–1992. The mine was originally worked for copper from 1768 to 1883 with small-scale copper precipitation in a series of small ponds that surround the 'mountain' — in reality a 150 m high hill. However, it also contains substantial amounts of lead and zinc. It is of volcanogenic origin in a back-arc setting with numerous exhalative sulphide orebodies associated

The Great Opencast, Parys Mountain (photo: Tim Colman)



with basal Silurian rhyolites and tuffs. These are underlain by Ordovician (Arenig–Llanvirn) shales and overlain by Silurian Llandovery mudstones. The whole package has been folded into an overturned syncline with remobilisation of some of the sulphides into the surrounding sediments.

Pyritised mudstone (photo: Tim Colman)



Overturned syncline at west end of Great Opencast, just below the viewing platform, looking west (photo: David Bate)

We started at the Copper Mine Trail car park (SH 437904) and walked to the viewpoint which gives an excellent vista of the Great Opencast. We then walked along the trail past flow-banded rhyolite and down into the Great Opencast to see the intensely mineralised black cherty sediments in the core of the syncline which was visible in the western end of the Opencast looking back towards the viewpoint. We then followed the trail back to the car park. Ian Stimpson was thanked for a highly informative, well planned and executed field trip. The weather had been dry throughout, although one member of the group, who had stayed at Conwy, said that the mainland had been wet throughout the weekend.

Tim Colman

BOOK REVIEW

Delving along the Derwent – a history of 200 quarries and the people who worked them, The Delvers, 2019, 191 pp (printed by Gomer Press, Llandysul), ISBN978-1-871827-43-9.

The Delvers are a group of individuals brought together by Ian Thomas, a former President of our Society and for many years Director of the National Stone Centre at Wirksworth, which he himself initiated. Together, and with the assistance of many others, the Delving Team undertook to research the history of quarrying across a 20-mile stretch of the Derbyshire Peak District based around the Derwent River between Matlock, Parwich and Wirksworth in the north and north-west, and Derby in the south. The book begins with a widely applicable guide to sources of information on stone quarrying before going on to describe the study area's geological setting (Carboniferous Limestone, Millstone Grit and Coal Measures) and completes this introductory section of the book with a history of stone working from prehistoric times to the mid-18th century. Of especial interest is the recognition by the team members of the historic significance of Alderwasley as a source of Iron Age and Romano-British quern stones manufactured from Millstone Grit. Examples of these early rotary hand-driven querns, employed for milling flour, were discovered at the sites where they were quarried.

The main part of the book is a detailed, well-illustrated gazetteer of quarries and associated features and buildings from at least Roman times up to the present day. Special attention is given to the nationally important Hopton Wood Stone quarries, which all fall within the study area. This valuable account includes illustrations of the varied applications of Hopton Wood Stone in buildings, memorials and the arts. Also given special treatment are the quarries and educational facilities that make up the National Stone Centre at Wirksworth. There is a section on the manufacture of mineral pigments and paints, and a final section (followed by appendices) on quarrying families.

The work warrants re-publication in a more lavish (e.g. A4) format giving more room for the many images to be expanded in size. Copies of the book are available from the Rock Shop (price £18) at the National Stone Centre at Wirksworth.

David Bate