

CHARNIA

**The Newsletter of the Geology Section (C) of
The Leicester Literary & Philosophical Society**

www.charnia.org.uk

MAY 2014

Editorial May 2014

Once again I greet you from the depths of Norfolk. We have been obliged to extend our stay out here, and that is one of the reasons why we have a new chairman for the next session of the Section. Joanne felt she could no longer fulfil the duties of Chairman to the level you are all accustomed to, and resigned at the AGM, with Mark Evans taking over. Albert Benghiat then stepped into the Vice-Chairman's position, but elsewhere things stayed much the same. One thing that has concerned us on the committee was the small loss we made on the Saturday Seminar in 2014. It wasn't that the day was unsuccessful, indeed several people amongst the good attendance told me it was one of the best we'd put on, but perhaps it was due to a little naivety on our part, when we didn't lay down clear guidelines for the speakers regarding their expenses. The result was we were hit with some large expense claims, which were solely responsible for the loss. I must stress that was not the fault of the speakers, they believed they were free to make whatever arrangements they wanted to. We'll know better next time!

As its never been done before, and because some people have raised queries regarding the status of Charnia, I felt that I should make a statement on where Charnia stands in the great panoply of geological publications, which I'm happy to do. As it has always been, Charnia is the newsletter of an amateur society and as such has no professional status. It is not a journal. Charnia articles (they are not papers) are not recognised by the ICZN and are not citable, i.e they should not be referred to in connection with research in other professional publications. This is always stressed to contributors. We are a leisure publication, in journalistic speak.

A couple of events later in the summer might interest you. Firstly on June 28th we have a joint meeting with the Yorkshire Geological Society to Charnwood, and then on September 7th and 8th Leicester is hosting the Annual Meeting of the Geologists' Association.

Finally I must correct an error which crept into the last Charnia. In the article by Moseley and Boynton the second photograph is of Deer Barn Wood, not Stable Pit.

Have a great summer, and if you see anything interesting on your travels, why don't you consider submitting something about it to Charnia?

Andrew Swift

Winter Programme 2014/15

All talks are 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 2254904

Wednesday October 15th

Professor Chris Stringer (Dept of Earth Sciences, Natural History Museum, London). **Title TBC**

Monday October 29th

Professor Gideon Henderson (Dept of Earth Sciences, Oxford University).
Caving in to past climates

Wednesday November 12th **TBA**

Wednesday November 26th

Professor Patrick Boylan (City University, London). **The geological significance of Darwin's four weeks in the Andes in March – April 1835**

Wednesday December 10th

Christmas Meeting, New Walk Museum

2015

Monday January 12th

Parent Body Lecture

Dr Tom Sharpe. **Celebration of the bi-centennial of William Smith's geological map**

Wednesday January 14th **TBA**

Wednesday January 28th

Professor Sarah Davies, Dept of Geology, Leicester University). **Shining a light into the dark corners of the sedimentary record**

Wednesday February 11th
Member's Evening, New Walk Museum

Wednesday February 25th **TBA**

Saturday March 7th
Annual Saturday Seminar. Theme TBA

Wednesday March 11th **TBA**

Wednesday March 25th
AGM & Chairman's Address. Dr Mark Evans (New Walk Museum). **The Mesozoic marine reptile renaissance**

Remainder of Summer Excursion Programme 2014

Saturday 10 May. 10.30. **Great Tew Quarry**, SW of Banbury, Oxfordshire. Leader Andrew Swift. Meet 10.30 at quarry entrance at SP 393 296

Saturday June 7th **Volcanics of Derbyshire**. Leader Mike Allen

Saturday June 28th Joint meeting with YGS. **Charnia & Neo-Proterozoic strata of Charnwood**. Leader Dr Mike Howe

Saturday July 12th **Oxford Museum**. Leader Professor Paul Smith. Meet at Museum (Park & Ride recommended) at 10.30.

Saturday 6th & Sunday 7th September. Hosting the **Annual Meeting of the GA at Leicester** with field trips on Sunday. Leader Dr P R Wilby

Friday 19th – Sunday 21st September. **Weekend excursion to the Llyn Peninsula**. Leader Dr Charlie Bendall.

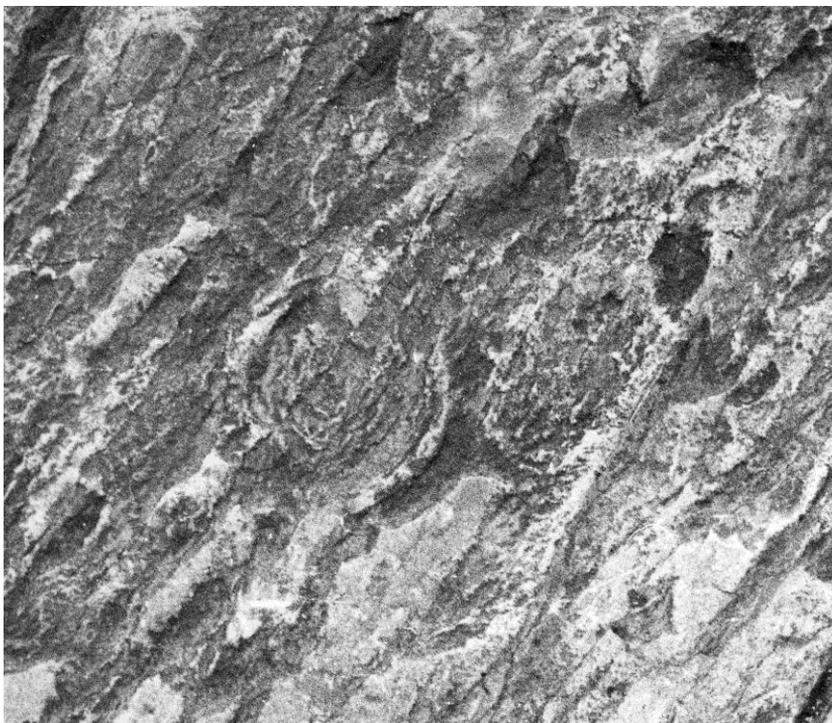
Please contact Field Secretary Rob Tripp for full details, 0116 2790094 or rob.n@newford.u-net.com

A note on fossils found in the Beacon Hill beds, Charnwood Forest

The lowest fossiliferous beds in the Precambrian of Charnwood Forest are those in the Ives Head Formation. These yield *Ivesheadia lobata*, *Blackbrookia oaksi* and *Shepshedia palmata* which have been well documented (Boynton & Ford 1995). Most of the Ives Head fauna does not reappear in later formations, however.

Succeeding the Iveshead Formation is the Blackbrook Formation, which has yet to yield fossils, despite searches on bedding planes in Longcliffe Quarry and near Blackbrook Reservoir. Some bedding planes were examined in 2006 by Mark Evans on the M1 near Markfield, but nothing very convincing was found.

Above the Blackbrook Formation is the Beacon Hill Formation. The type section is on the hill of the same name, where, near the top, two single-ringed discs were noted, one very faint.



The faint circular discs on Beacon Hill

Two similar single-ring discs were seen on the front door porch of Long Hill Farm, which is situated on the east slope of Beacon Hill overlooking Charnwood Golf club

A very good succession in the Beacon Hill beds can be seen in Bradgate Park, where the oldest beds are found on the northern edge of the Park. The sequence then ascends stratigraphically up to the Leicestershire Yeomanry memorial. The lowest horizon is a bedding plane near Old John which shows much microbial matting and some single-ring discs.



Microbial matting, north of Old John

The next fossiliferous horizon is found at the Old Stables on the south side of Old John. Here the Earl of Stamford had a stable enclosed by wooden fences and a roof, where his horses were rubbed down after their races in the Park. The back wall of the stable is formed by a dipping bedding plane on which there are three ovoid discs. The bedding plane extends out to the right and a large disc with possible stem emerging has been seen.

The highest exposure that could be fossiliferous occurs immediately to the north of the Memorial. Here there are possible parallel tubes,

occasionally bifurcating. These may be *Bradgatia*. A disc was also found by Aron Bowers near this outcrop.



Ovoid disc on bedding plane. Old stables, Bradgate Park



Possible *Bradgatia*. Adjacent to War Memorial

Sedimentation in the Beacon Hill Beds is mainly of a banded, fine-grained, light colour and the rock type is weathered dust tuffs, in which simple discs occur.

The succeeding Sliding Stones Slump Breccia records a period of earthquake activity which caused slumps and sometimes overturning of the bottom sediments.

Conditions then became much quieter, allowing the dust tuffs of the Bradgate Formation to be laid down. Here the familiar fauna of the Mercian Assemblage could develop, expand and diversify in size, with juvenile forms present.

More research into the Beacon Hill beds could prove very rewarding. What else might be found?

Reference

Boynton, H. E. & Ford, T. D. 1995. Ediacaran fossils from the Precambrian (Chanian Supergroup) of Charnwood Forest, England. *Mercian Geologist*, **13**, 165-183.

Helen Boynton

The following article, which should be read in conjunction with the one above, reports on further investigations into possible fossils from the Blackbrook Formation

Possible fossils in the Blackbrook Formation outcrops on M1 sections near Shepshed

In September 2006 ME was invited by geotechnical engineers from Arup to accompany them on a visit to examine sections bordering the M1 near Shepshed in connection with the now abandoned plan to widen the motorway. Several disc-like structures were seen on bedding planes in Blackbrook Formation outcrops. Photographs were taken as the similarities to the disc-shaped fossils of the overlying Maplewell Group were intriguing. The difficulty in accessing the outcrops has meant that a follow-up visit has not yet been possible.

Since the visit to the M1 section 8 years ago re-examination of the photographs has been made and two of the photographs taken look more promising. One shows a disc with fronds attached, two of which appear to bifurcate (Fig. 1). The second photo shows an ovoid disc approximately four centimetres long (Fig. 2).



Figure 1



Figure 2

More investigation of outcrops of the Blackbrook Formation of similar age could prove to be exciting, as these discs near Shepshed could be the first fossils found in this part of the Charnwood succession, and fill a gap between the Ives Head fossils below and those of the Beacon Hill and Bradgate Formations above. An extensive bedding plane near Blackbrook Reservoir is a possibility for more discoveries.

Mark Evans & Helen Boynton

Field Trip Reports

British Gypsum Mine, Barrow-upon-Soar

11th & 25th February, 11th March 2014

Although the mine at Barrow is on our doorstep, it became apparent that none of the Section had been to visit since Andrew Swift went down, hanging in a bucket, perhaps more years ago than he would like to recount. Certainly for many of us, the visible structures of the site were assumed to be anything other than being associated with mining. As the site is close to the Mountsorrel granodiorite quarry railhead, it could be taken to be a covered aggregate storage area; or might it be an indoor football stadium? The catch, of course, is that the activity of gypsum mining here yields no spoil; and the gypsum that is won, surfaces into the site homogeniser, and so is not seen. The only waste product at the Barrow mine is the water that is driven off, in the kiln, from the compound structure $\text{CaSO}_4 \cdot 2\text{H}_2\text{O}$. The gypsum seam that is exploited at Barrow, the Tutbury Gypsum, is about 3 to 4 metres thick, and occurs in the uppermost 30 metres of the marl (once k/a Keuper), of the Mercia Mudstone Group, of the Upper Trias.

Visitors to this, advanced, Saint-Gobain facility, which became operational in 1992, are met by the most welcoming Staff in the administration building, and are escorted to a locker room, where each is relieved of camera; cell phone; watch; pace-maker, and any other techno-gadget that is electrical in operation. This was surprising to those of the first party, as one doesn't associate explosion risks with halites. However the elfin of safety, is mindful that once a pocket of marl was disturbed that exuded methane derived from a small shoal of fossil fish, possibly *Semionotus* genus. No other occasion of the presence of methane has been detected within the mine subsequently.

From the locker room, a party passes to the safety room to be issued with safety lamps, and emergency breathers. If ones hard hat has the spot on which the lamp would fasten, its a winner, otherwise one wears the cable over the shoulder! From there to the Rover, and the reason why parties are limited to five only. With the Guide driving, the mine is entered via an inclined adit, sealed by double doors that enable ventilation within the mine. The adit is largely unlined, apart from where it passes through a

seam of limestone. This mine is the driest mine in Britain; potable water is piped into it to provide for the staff, of which only five on each shift run the whole mine, and for the cutter machine. About halfway down there is a plaque on the wall that delineates '**Sea Level**'. After passing through the doors at the bottom of the incline, the old galleries provide areas for the store room, machine shop, and canteen. The cutter and dumpers do not surface once into the mine.

For those new to the mine, a very large ball of twine, would be ideal to track the route back from the face. The mine is operated on the pillar and stall principle, which allows for about 75% extraction of the gypsum. The permitted reserves are in excess of 20 Mt and the mine will operate, over an extended area, for more than 20 years. The stalls, or galleries, are cut to 10 metres width, and the chequered pattern, without signs recognisable to a layman, soon had most disorientated, as we were driven to and from the face. The operation at the face is by a continuous mining cutter, a 100 tonne machine, with a horizontally rotating 6 metres wide drum up front, on which carbide picks claw at the gypsum face. As gypsum is a soft mineral, at 2 - 2.5, the rate of advancement is rapid. The machine cuts forward into the face, oscillating up and down for about 10 metres; it is then reversed, and moved sideways, to claw out a further 4 metres. Through the body of the cutter is a conveyor, which passes the gypsum into a dumper, which shuttles between cutter and the conveyor system that takes the product to the surface. Within the gypsum seam there are occasional pockets of anhydrite, which although not much harder than gypsum (about 3), when encountered will cause the cutter machine to buck about, and ruins all the picks. There are then, a few blind stalls within the mine, and also a volume of gypsum is not extracted in close proximity to bore holes, or to surface buildings.

The extracted minerals are poured into the homogeniser, which we visited, and is the dome-like structure on the site. This raw product has varying amounts of marl, and the piling in the dome acts to mix, or homogenise the product, before it is passed to the mill, and to the kiln. Desulphogypsum from the scrubbed flues of coal-fired power stations is mixed with the mined product at Barrow, before the mixture is milled. The kilning at 150° to 165°C removes three quarters of the water to produce plaster of paris, which then goes on to be processed, to make up the portfolio of plaster products from the Barrow works. The bagging plant is completely automated. Sacks are delivered to site in reels, and are fed into

an inflating carousel; then to the filler and sealer. A conveyor system takes them to the palletising area, which is computer controlled, and the pallets are then taken to the warehouse. This is a warehouse that must be the highest in Europe. Again, the system is automated. The four fork trucks roll on monorails, between the shelvings, beneath another rail that is some four house heights above. As a road transporter arrived, the order would be collated, and delivered to the loading bay without manual labour.



Before entering Barrow gypsum mine 25.2.14

photo Rob Tripp

It would be good if I could name and thank the Staff that treated us on each of the visits, but each visit was entertained by different members of staff. I hope that they will accept a group 'thank you'; and our thanks and appreciation for splendid visits go to British Gypsum and Saint-Gobain.

Rob Tripp

Cover photo: fluorspar from Cavendish Mine. Photo Roger Latham

Photographs from recent field excursions



The Cavendish Mill party 18.3.14

photo Roger Latham



Minerals from Cavendish Mine 18.3.14

photo Roger Latham



In the depths of Cavendish Mine 18.3.14

photo Roger Latham

From the Archives



Bradley Fen 17.8.03



Hock Cliff on the River Severn 22.6.08



Lake District 4.6.11

photo Joanne Norris

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